

A Century of Progress Exposition for 1934 Is Livelier and Bigger Than Ever



All attendance records for World's Fairs are being broken this summer by the second presentation of A Century of Progress exposition in Chicago. Above are some action photographs

taken on the grounds. (1) Nose of the Union Pacific streamlined train. (2, 3, and 4) New Chevrolets being turned out on a regular production line in the General Motors building.

(5) Mary Devine, home economist on duty at the Stewart-Warner exhibit, poses with a McCord Metflex ice tray. Stewart-Warner displays refrigerators, radios, cameras, and accessories.

BY G. F. T.

Westinghouse in Hall Of Science at Fair

About this time last year the industry was in an uproar over the Grunow refrigerating unit in the Hall of Science at A Century of Progress exposition.

It seemed that BILL GRUNOW had pulled a fast one. While the other manufacturers had been spending important money to acquire exhibit space at the Fair, Bill had arranged for one of his refrigerating units (cycling under glass) to be displayed as a scientific exhibit in the Hall of Science.

Not only did he get his exhibit space free, but he was able to advertise "only refrigerating unit in the Hall of Science," and to put tags on all his models: "Exact duplicate of refrigerating unit in Hall of Science at World's Fair." Some of the advertising went even beyond that.

Naturally there was a big hullabaloo throughout the industry. Almost frantic attempts were made to have the Grunow unit removed from its niche. But throughout the summer it stayed there, although toward the end of the season it had a companion—a glass-enclosed G-E Monitor Top.

This year the Hall of Science refrigeration exhibit has been loaned by Westinghouse. Mounted on a panel flush to the wall so that every part may be more easily studied, the compressor, evaporator, and refrigerant lines are all assembled in working order.

Electric Light and And Power Exhibit

Principal new feature at the Electric Light and Power Industry exhibit this year is an air-cooled theater offering free entertainment in the form of marionettes who, in music and verse, relate the conversation of a customer who thinks his electric bill is too high.

The customer, "Mr. Pettigrew," after sinking two much of the family

finances in an unprofitable game of contract bridge, comes home to glare and swear at the electric meter for having, as he says, continuously robbed him of his substance. How he learned differently is the theme of the puppet comedy.

If the visitor to the fair last year saw the Electrical Exhibit he will find in addition to what was there then many new things to fascinate him. He will be able, for instance, to try out on his own body the new fever machine from which the medical profession expects great things in the cure and alleviation of disease. Two of these machines are included in the exhibit.

The home mechanics who last year were pleased by the lathes, saws, drill presses and other machines designed for basement workrooms will this year have their covetousness more deeply stirred by seeing these machines in operation and a group of men turning out complicated what-nots of every kind.

All through the exhibit extensive revisions and improvements have been made. In the electric kitchen, on the electrified farm, and in the reduced scale displays of model operating room, school, retail stores and shops, all of the equipment has been refurbished and improved.

The exhibit, as last year, occupies all of the semi-circular second floor, a space about 550 feet long, of the main electrical building of the exposition.

Working models of basic devices and machines designed to show physical processes in the production of electricity again answer questions by demonstration as fast as they spring into the mind of the visitor. Flows of vari-colored liquids in a simplified glass replica of a boiler show how water is turned into steam to drive power plant turbines. A large size section of a turbo-generator with wheels and rotor in full relief exposes the interior mechanism of this most important machine.

The utilization of electricity is still the major burden of the exhibit. There are six main divisions of the utilization display. They show several of the uses of electricity in commercial buildings, in schools and colleges, in hospitals and public health institutions, in various industries, in the home and on the farm. The greater part of these displays is of actual equipments and devices in full size installations, recourse to miniature

presentations being taken only in necessary instances.

A complete set of farm buildings in model size showing the latest developments in design of such buildings gives an overall picture of farm electrifications. The details of this picture are filled in by displays of actual equipment to perform the many tasks to which electricity can be applied on the farm. In the list of displays under this head are more than 30 different electrical applications ranging from bug killing to silo filling. General illumination controlled by the photo-cell, or "electric eye," black board lighting for the conservation of child eyesight, and a demonstration of the use of talking motion pictures in education feature the model school room.

Five model stores show the most modern methods of lighting commercial places according to their specific requirements as well as the specialized uses to which electricity can be put in each. The theme of the commercial displays is the effectiveness of electricity as a salesman.

Science Dramatized

A continuous spectacle of scientific wonders is being presented in a great outdoor theatre in the court of the Hall of Science at the new World's Fair of 1934.

Ten thousand spectators at a time may view the seeming miracles being performed on the stage. Performances begin at noon and will continue until the closing of the Exposition at night.

This new feature of the Exposition has been worked out by the scientific staff as a major addition to the educational exhibits. The different acts are 20 to 25 minutes long and demonstrate invisible rays and other powers in action in a series of shows which will be a visualization of the achievements of science.

The "acts" are supplied chiefly by the laboratories and research staffs of important industrial organizations exhibiting at the Fair. This facilitates inviting spectators to ask questions. It will be impossible for questions and answers to be handled from the stage to huge audiences in the limited time of the different "acts," but interested spectators wishing to ask questions will be invited to come to the exhibits where the lecturers will be found ready to explain in detail.

Setting for the stage is in the open

end of the vast U formed by the wings of the Hall of Science. Permanent seats for 5,000 spectators have been placed in the court, and 5,000 more may be accommodated on the terraces above the wings and on the great terrace across the east front of the Hall of Science.

The stage provides a background of appropriate atmosphere and effects for the scientific demonstrations. Elaborate electrical equipment, power and laboratory apparatus has been installed. With the experience of last year in giving scientific miracle shows expert showmanship has been developed.

The underlying purpose of the scientific theater is the serious presentation of science at work but the presentation of the "stunts" brings out surprises and thrills in a dramatic manner.

Among the "acts" in the science

theater is an elaborate demonstration developed for the show by the World's Fair Radio Amateur Council. A complete radio station is wheeled on the stage and the demonstration is conducted by operators who will be able to reach sixty different countries of the earth from the theater. Messages may be received from Polynesia, from the interior of Africa, or from the Byrd Expedition in the Antarctic. Screens 30 ft. square reproduce the translations of code messages as they are received. The public address broadcasting system of the Exposition brings the spoken messages to the audience in the theater.

Operators with portable sending sets may interview celebrities in Chicago during the show and the conversation will be repeated from the stage by the broadcasting system. Other operators may talk from different parts of the Exposition, from the observation balloons, from airplanes, or the Sky Ride towers.

World in Miniature

"The World in Miniature," a collection made and owned by Mrs. James Ward Thorne of Chicago, occupies what last year was the Edison Memorial Building.

The collection consists of a gallery of 24 miniature rooms from various countries and periods, the fruit of several expeditions by Mrs. Thorne into France, Italy, England, and Spain.

In making up the tiny rooms, which range in size from 25 to 36

in. long and from 18 to 20 in. deep, the designer has used real materials whenever possible. Spanish and Italian lamps, grilles, and screens are iron; the furniture wood, carved in finest detail and covered with genuine fabrics; the lighting fixtures are of brass and crystal; the rugs real pieces of Aubusson and Petit Point.

All rooms are lighter either through the windows or the open doors in order to create a realistic atmosphere.

Low Travel Rates

Whether coming from the West or from the East, the World's Fair visitor is going to get an even better "break" on railroad transportation this summer than he did last.

From the Pacific Coast, for instance, first class fares, good in sleeping cars, are being sold at approximately two cents a mile each way, with a return limit of October 31. Tourist tickets, good in tourist sleepers, are about 20 per cent lower than the first class tickets while coach tickets are 33% less than the first class rate.

Other Western fares as low as one cent a mile have been put in. The week-end coach tickets from all points east of the Missouri river to Chicago are a penny-a-mile with a 10-day return limit. A slightly higher rate is being charged from points west of the Missouri.

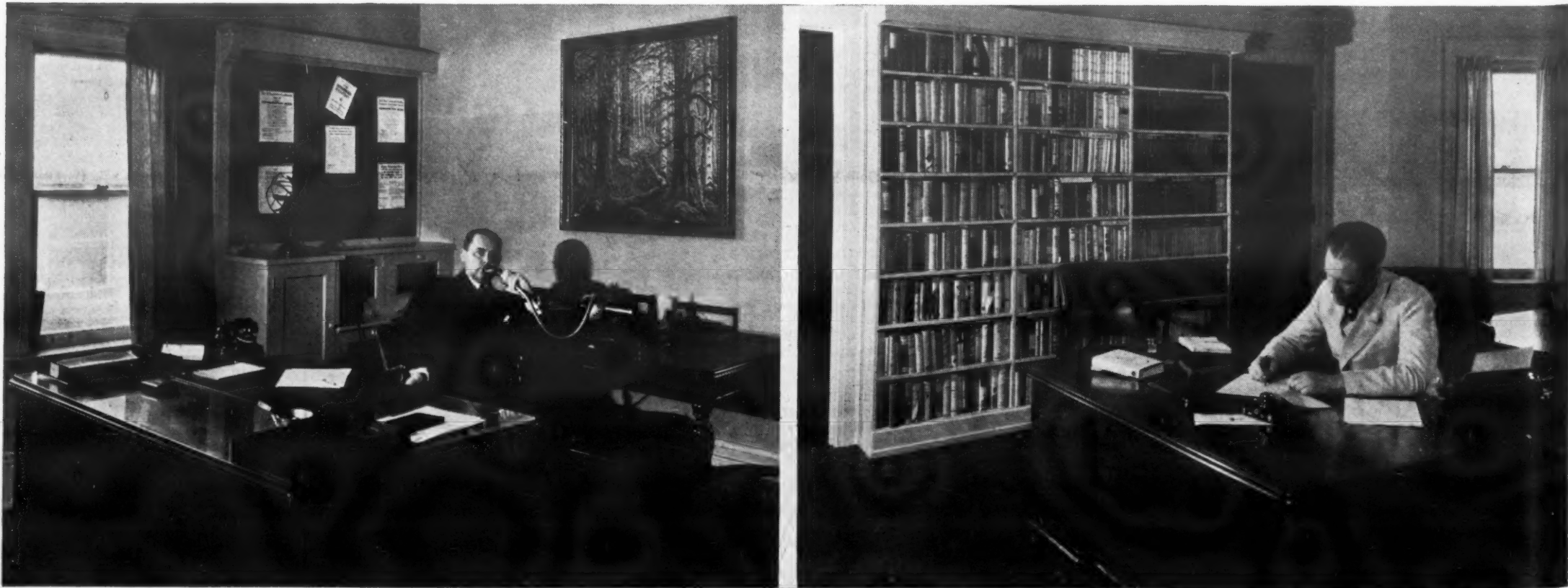
A 15-day coach ticket on sale daily is being offered at 1.5 cents per mile each way from almost all Western points, while 30-day tickets good in coaches are being sold for 1.8 cents a mile in each direction.

Two kinds of first-class tickets are accommodations will find a two-cent a mile rate on sale daily from Western territory with a 30-day return limit and a summer-long rate of 2.5 cents a mile.

From the East, coach tickets with a 15-day return limit will be sold daily for 1.5 cents per mile in each direction.

Two kinds of first class tickets are being sold from the East on Tuesdays and Saturdays during the World's Fair: (1) For the fortnight visitor, a 15-day limit ticket at one fare plus 25 cents, or approximately 2 cents a mile in each-direction, is offered, (2) a 30-day limit ticket is being sold for 1½ times the one-way fare for the round trip—this is about 2.7 cents a mile.

Examples of How NOT to Take Pictures for Electric Refrigeration News



With their little candid cameras representatives of the News have been having a great time getting and publishing informal, unposed snapshots of the industry at work and at play. But when they wanted pictures of themselves amidst their attractive new surroundings at 5229 Cass Ave., they hired a professional

photographer and posed. This is the result. (1) Advertising Manager H. W. Mateer at the dictaphone. Note the absence of a cylinder on the machine. Publisher F. M. Cockrell hints that now he knows why Mateer's advertising solicitation letters don't pull more orders. (2) Editor George Taubeneck, all prettied up

in an ice cream suit, makes a pretense of being busy doing nothing at a polished, papers-free desk. Normally you can't see the editor for the papers. Note to all publicity men: We couldn't have obtained a better object lesson in uninteresting photography if we had tried.

REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS. MEMBER PERIODICAL PUBLISHERS INSTITUTE.

ISSUED EVERY WEEK

VOL. 12, No. 10, SERIAL No. 276

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DETROIT, MICHIGAN, JULY 4, 1934

Entered as second-class
matter Aug. 1, 1927THREE DOLLARS PER YEAR
TEN CENTS PER COPY

New York May License Sellers Of Appliances

Ordinance Would Prevent Sale of Sub-Standard Equipment

By Elston D. Herron

NEW YORK CITY—That retailers of appliances and other electrical equipment in New York City will in the near future be required to secure a special license from the city government seemed likely last week as the commissioner of water supply, gas, and electricity considered provisions for a licensing ordinance.

While the immediate purpose of the plan is admittedly that of securing revenue for the city's depleted treasury, officials state that such an instrument would also give them a needed control over the sale here of sub-standard electrical equipment which is dangerous from the standpoint of both personal safety and fire hazard.

First announcement that passage of a licensing ordinance was probable was made several weeks ago by Commissioner Maurice P. Davidson, who heads the department of water supply, gas, and electricity. At that time, he submitted a draft of the proposed act to organizations concerned with electrical merchandising in this territory.

The draft was considered vague on several points: (1) whether the ordinance would affect only retail selling, or would reach over to the wholesaling operation of local distributorships and factory branches; (2) how and what standards were to be established for determining the suitability of equipment for sale in the city; and (3) what types of apparatus would be affected by the act.

Two organizations, the National Electrical Manufacturers Association (Nema) and the Electrical Association of New York, Inc., immediately took steps to clarify the proposed ordinance on these points, and both associations have submitted drafts embodying their recommendations for revision of the original document.

The two groups are seeking to forestall possibility of the city's establishing its own agency for setting up standards of construction and performance in appliances and other equipment, but whereas Nema suggests Underwriters' Laboratories for this work, the Electrical Association recommends the American Standards Association.

According to C. K. Nichols, commercial manager of the New York Edison Co. and member of the Electrical Association's committee on revision of the proposed ordinance, great effort is being made to secure appointment of one national organization to set up standards, one reason being the possibility of other cities

(Concluded on Page 9, Column 4)

Advertising of 'Cash Discount' Regulated

WASHINGTON, D. C.—Retail merchants who advertise or offer for sale on the installment plan merchandise which may be bought at a discount for cash without making it clear that there is a difference in the costs to the buyer, will be regarded as violating the "inaccurate advertising" provision of the retail code, according to a ruling made June 27 by NRA Division Administrator Robert Houston.

The ruling followed consideration of representations that certain merchants have been advertising that no extra charge is made when articles are bought on the installment plan and, at the same time, selling at a lower price for cash.

Following is the text of the administration's interpretation:

"It shall be an unfair trade practice under Article IX, Section 1 (a) of the code for a retailer to advertise or offer for sale any merchandise with a statement or representation that the merchandise may be purchased on any deferred payment plan, of whatever nature, without charge for such deferred payment, interest, services, privilege, or other comparable designation, when in fact discounts from quoted or marked prices are given on identical goods sold for cash and prices for payment are quoted, marked, or made available for identical merchandise, at the time the same is offered for sale."

The First Lady Inspects TVA Appliances



Mrs. Franklin D. Roosevelt inspects G-E's combination electric range and 'liftop' refrigerator at the Bureau of Home Economics. Left to right: Mrs. Roosevelt, Miss Nancy Cook, representing the Subsistence Home Bureau; Dr. Louise Stanley, chief of the Bureau of Home Economics, U. S. Department of Agriculture; Col. Louis McHenry Howe, secretary to the President; and David E. Lilienthal, president of the Electric Home and Farm Authority and a director of the TVA.

Kelvinator Builds 3 New Ice Makers

DETROIT—Kelvinator Corp. has just announced several additions to its line of ice makers.

Installed separately or in combination with Kelvinator vertical-type cooling units, the new ice makers are capable of providing the exact quantities of ice and the exact cooling service needed by users in their service refrigerators, according to Commercial Sales Manager J. A. Harlan.

The new units operate by direct expansion. Refrigerant tubes are integral with the shelves. The IM4, which is a 4-tray assembly, has a capacity of 108 cubes. The 7-tray IM7 produces 180 cubes—19½ lbs. of ice.

For use primarily in large restaurants and in bar installations Kelvinator is also manufacturing the IM15, an ice maker of 405-cube capacity.

Frigidaire Sales at G-M Shows Increase

NEW YORK CITY—Sales of Frigidaire electric refrigeration equipment at the General Motors shows held throughout the country last month were 21.4 per cent greater than sales made during the shows held in 1932.

Water Cooler Division Formed by New York Refrigerator Group

By Elston D. Herron

NEW YORK CITY—When E. B. Latham & Co., Leonard distributor, and Crosley Distributing Corp., factory branch, came into the Refrigerator Association of New York, Inc. last week, the number of that organization's members jumped to 19. Its roster now includes every major domestic refrigeration distributorship in metropolitan New York.

A recent development in the association was establishment of a water cooler division which operates separately from the refrigeration division, but is answerable to the group's board of governors for its doings. Arthur F. Callahan is managing director of the entire association.

The new division is just getting under way in its work to improve water cooler merchandising in this territory. Its roster includes 12 companies which, with the makes they sell, are as follows:

Allen-Ingraham, Inc., Westinghouse; Boston Water Purifier Co., Kelvinator, Servel, G-E, Cordley & Hayes, and its own; Canaday Cooler Co., Frigidaire and its own; Cordley &

(Concluded on Page 9, Column 1)

Finance Charge Schedule On Commercial Cabinet Sales Is Approved

WASHINGTON, D. C.—The NRA last week announced its approval of a uniform schedule of carrying charges on deferred sales of commercial refrigerators.

Section 6 (a) of Article VIII of the code of fair competition for commercial refrigerator manufacturers provides that charges for time payments extending more than three months shall not be more liberal than those established by the Code Authority. The approved schedule, therefore, was prepared in accordance with this provision.

As a result of the NRA's approval of the schedule of carrying charges fixed by the Code Authority, no member of the industry may sell his commercial refrigerator, where full payment is not to be made within three months, without making a specific financing charge at least as great as those specified in the schedule. He may charge more but he may not charge less.

"We do not know whether the adoption of this schedule is a precedent, but we believe it is," declared Paul H. Sullivan, executive secretary of the Commercial Refrigerator Manufacturers Association, when he heard of the NRA's approval. "To our knowledge, no other industry has attempted to regulate financing of sales in this manner."

"The reason back of this clause in the code is the fact that for years members of this industry have been getting less strict in their deferred payment terms, as a result of which, it might truthfully be said that in recent years members of the industry have paid more attention to the investment banking business than to their real functions as manufacturers of commercial refrigerators. Examples may easily be found of how some firms made no finance or carrying charges whatever, granting terms of payment for periods of three years, in some instances."

According to Mr. Sullivan, approval is expected shortly on several important amendments to the commercial refrigerator code which were proposed at a hearing May 15.

Boyer Heads Kelvinator Commercial District

DETROIT—Appointment of O. F. Boyer, widely known in the field of commercial refrigeration, to the management of Kelvinator Corp.'s southern district has been announced by Commercial Sales Manager J. A. Harlan.

In point of service Mr. Boyer is one of the oldest electric refrigeration men on the Pacific Coast. From 1925 to 1931 he was vice president and general manager of the Kelvinator distributing organization in California. Since then he has been with two other companies on the coast.

Court Reverses Decision on Cold Control Patents

Licensing Agreements May Be Voided by Verdict Of U.S. Judge

KANSAS CITY—Apparently voiding that portion of present licensing agreements between Frigidaire Corp. and other manufacturers of household electric refrigerators which pertains to the cold control, a decision was handed down on June 18 in the U. S. Circuit Court of Appeals of the Eighth District that the manual temperature control mechanism used on Majestic electric refrigerators does not infringe the Blackmore and Summers patents, Nos. 1,658,323 and 1,819,979, controlled by Frigidaire.

The case represents an appeal by Grigsby-Grunow Co. of Chicago (bankrupt manufacturer of Majestic refrigerators) from the decision made in September of 1932 (see Oct. 15, 1932, issue of ELECTRIC REFRIGERATION NEWS) by Judge Charles A. Dewey of the U. S. District Court in Des Moines, Iowa.

Judge Dewey ruled at that time that the Majestic switch structure was an infringement of the Blackmore and Summers patents—a ruling which was subsequently appealed by Grigsby-Grunow, and now carried to a successful conclusion by the patent attorneys representing that manufacturer.

Later in 1932, Frigidaire prepared and executed a licensing agreement which permitted four companies (Ranco, Penn, Cutler-Hammer, and G-E) to build cold controls which were understood to be covered by the patents in question, and to sell them only to a group of about 50 specified refrigerator manufacturers (see Dec. 14, 1932, issue of ELECTRIC REFRIGERATION NEWS).

Bureau Estimates Sale Of 813,571 Units In 5 Months

NEW YORK CITY—Estimates by the Electric Refrigeration Bureau place United States sales by all manufacturers of household electric refrigerators at 813,571 units for the first five months of 1934.

According to the Bureau compilation, 277,988 household electric refrigerators were sold by the industry during May, establishing a new high mark for sales in any one month. Thus far 1934 has presented an unbroken parade of record-breaking months, sales in each one since the first of the year being higher than in the same month of any previous year in industry history.

If sales in June of this year reach the same volume as in June of 1933, the industry will perform the unprecedented feat of exceeding the 1,000,000 mark during the first six months of the year. The six months figure for last year, as estimated by the Bureau, was 666,750, being 146,821 units short of the total piled up during the first five months of the current year.

New York leads all other states with a total of 100,354 for the five-month period. Second place goes to Pennsylvania where 76,286 units were sold. Illinois sales totaled 60,737 giving it third in the ranking. Ohio, with 56,687, and California, with 41,246, were fourth and fifth, respectively.

The five months' quota set by the Bureau at the beginning of the year has been realized 154.00 per cent. Quota realization ran high in those states which are partially included in the area embraced by the Tennessee Valley Authority. Of all of the 48 states quota realization was highest in Georgia with 288.3 per cent and second highest in Tennessee where the reported figure was 283.5 per cent. Realization in the other TVA states was as follows: Alabama, 262.8 per cent; North Carolina, 260.3 per cent; and Mississippi, 150.4 per cent.

The estimates made by the Bureau are for the United States only, and do not take into account the several thousand units which have been shipped to foreign countries so far this year.

The tabulation of five months' sales by states will be found on page 14 of this issue.

Cooperative Show Spurs Cleveland's Interest in Air Conditioning



This unposed photograph taken at the Air-Conditioning Show put on by the Electrical League of Cleveland demonstrates the interest that the public is taking in this new industry. Officials declare that business men in particular made a close examination of the equipment exhibited. The show is to be continued through July.

By G. F. T.

Sidewalk Cafes

Last year we tried to give you a complete picture of the Fair by means of words and photographs. This year we'll try to tell you about the differences between the 1933 and 1934 expositions. And there are plenty.

To begin, did you know that Chicago will have sidewalk cafes, like European cities, this summer? Dinner *al fresco*, 'neath a gaily umbrellaed sidewalk spot fronting majestic Lake Michigan, will be possible to Chicago visitors very soon.

Kelvinator Exhibit

One of the largest and most prominent of the refrigeration industry's contributions to the 1934 Century of Progress exposition is Kelvinator exhibit, which occupies a commanding location on the second floor of the Electrical Building.

A complete line of Kelvinator products—refrigerators, water coolers, air conditioners, and oil burners—is incorporated in the display. Visitors are accommodated by a staff of 25 attendants.

Featuring the Kelvinator exhibit is a Tatterman marionette production, "The World On A String," a portrayal of the development of the art of food preservation "from cave to Kelvinator."

Starring in the "cast" are marionette counterparts of cave dwellers, Napoleon, Nero, King Louis IX, Egyptian sun-worshippers, Lord Kelvin, Sir Francis Bacon, and a score of other historically significant figures. Regular performances of the marionette show are given in a theater which seats 150.

A cave man, one day a few million years ago, discovered that meat stored in the cool corners of his cave remained edible much longer than the meat left lying in the warmer parts of his dwelling. The story of this primitive experiment in refrigeration constitutes the first scene in "The World on a String."

Ten of the high points in the history of food preservation are portrayed in this play, each in a scene showing authentic costumes and background of the period represented.

The rare delicacies of Imperial Rome tasted fine when they were fresh, but they had a way of spoiling quickly and killing all the royal guests—until one of the sharp-witted Caesars thought of utilizing the snow from distant mountains for refrigeration.

Another pestilence laid Frenchmen low by the thousands until good King Louis IX put through and enforced the "Statutes of the Cooks," requiring that meats be of good quality and in good condition when sold to the public—or off with the food-vendor's head.

Sir Francis Bacon's mental balance was gravely questioned in 1626 when he stuffed a fowl with snow to keep it fresh on the way from Highgate to London, but Sir Francis had the right idea.

Napoleon was so certain that an army "travels on its stomach" that he offered 12,000 francs for a method of preventing food spoilage. Francois Appert, after experimenting two years, found the answer that would claim that prize. He boiled a sealed jar containing cooked meat. Napoleon conquered the enemy, and canning was given to the world.

So it goes, step by step through the dramatic story of man's struggle to keep perishable food longer than a day, down to present methods of refrigeration—and, of course, Kelvinator.

The performance of the Tatterman marionettes, from 12 noon until 9 p. m., each cycle starting on the hour, is directed by William Duncan, nationally known puppeteer. The show is free.

The theater, which opens into Kelvinator Hall, the spacious rotunda about which the exhibit centers, is air conditioned by Kelvinator equipment. The latter utilizes a 20-hp. condensing unit which forms a part of the main display of Kelvinator products and operates in full view of the passers-by.

A glass-enclosed "crystal stage," so placed that it catches the attention of both the first and second-floor traffic, is used to announce the performances in the theater. A marionette pianist performs on this stage at two-hour intervals.

The exhibit is supervised by its planner, JOHN S. GARCEAU of Kelvinator Corporation's advertising department. And just between us girls, Johnny Garceau is propagating more ideas per minute these days than any exhibit head we've run across at the Fair.

Leisure for Living

And speaking of theatrical performances, the Westinghouse show, "Leisure for Living," one of the attractions in the Electrical Building at A Century of Progress, Chicago, is a crowd-puller.

This show is a complete, six-act performance, presented on a revolving stage, with an actress doing pantomime every 18 minutes during the 10 hours the exhibit is open.

One of the engineers attached to the Westinghouse exhibit apparently having little else to do has developed the following statistics: When A Century of Progress exposition is closed the end of next October, the performance of "Leisure for Living" will have been given 5,760 times. In pantomiming the part, during this run, there will have been produced, 5,760 stage falls, 120,960 smiles, 80,640 frowns, 63,360 expressions of surprise, and 1,169,280 steps.

Three actresses rotate in the star part, these being ANNADELL KIGER, HELEN BENNETT, and MARIE ENGSTRAND, all of whom have had considerable stage experience. Each of the girls is on duty three and one-half hours per day, but of course only about two-thirds of that time is spent on the stage.

The show, of course, is a dramatic presentation of Westinghouse home appliances.

Frigidaire Exhibit

Convinced that the trek of visitors to the 1934 Century of Progress will greatly surpass the 1933 total, Frigidaire has expanded its participation this year.

'Now, My Territory'



Harry Ellis of Philadelphia gets the lowdown from Bill Humphries, General Household Utilities divisional representative, outside the Lake Shore Athletic Club in Chicago.

Major Frigidaire exhibit is the air-conditioned house, erected in the sunken garden at the north end of the huge General Motors building.

The house demonstrates, for the understanding of the layman, the tremendous advances air conditioning has made in the last few years to the point where it is a practical and necessary residential improvement.

In the General Motors building, half of one entire wing is devoted to a complete exposition of Frigidaire products—from smallest household electric refrigerator through the line of commercial products up to the large, 10-ton capacity, four-cylinder air-conditioning compressor unit.

Many operating displays are included in this exhibit so that visitors to the G-M building may have a better idea of the functioning of household refrigerators.

The display overlooks the automobile assembly line which drew 10,200,000 visitors into the building last year and which shows promise of again being the outstanding feature of the Fair.

In the travel and transport exhibit, Frigidaire is in the first modern design streamlined, high-speed air-conditioned Pullman car ever built, a part of the Union Pacific's new transcontinental train.

At the north end of the Fair, the electrical industries building has a new theater in which films and lectures illustrating the place of this industry in the world picture are shown and given. The theater has been air conditioned by Frigidaire as a sister auditorium to the Little Theater in the General Motors building, the only air-conditioned hall at the Fair last year, and which is in operation daily again this year.

Ford Exposition

Rising on the shores of Lake Michigan, its great white rotunda standing out in bold relief in the daytime, its striking pillar of white light flooding the night sky, the Ford Exposition Building at A Century of Progress is an impressive symbol of the Ford World Empire.

The largest single building at the 1934 World's Fair, it tells the dramatic story of the growth of the Ford Motor Company and the story of Henry Ford's part in national progress since the turn of the century. It attempts to relate, in graphic detail, the interdependency of the industrial world, and the part every modern city and town plays in today's industry. And it does much to prove and illustrate one of the Ford dogmas—the dependence of industry on the soil for a livelihood.

The Ford exhibit covers 11 acres. Five acres are in a park, with a frontage of 1100 feet on Lake Michigan, and most of the balance is occupied by the huge Ford Building. The latter is 900 feet long by 213 feet in width and rises to a height of 12 stories in its central section. Twenty-one large manufacturers, in addition to Ford, are participating in this single exhibit.

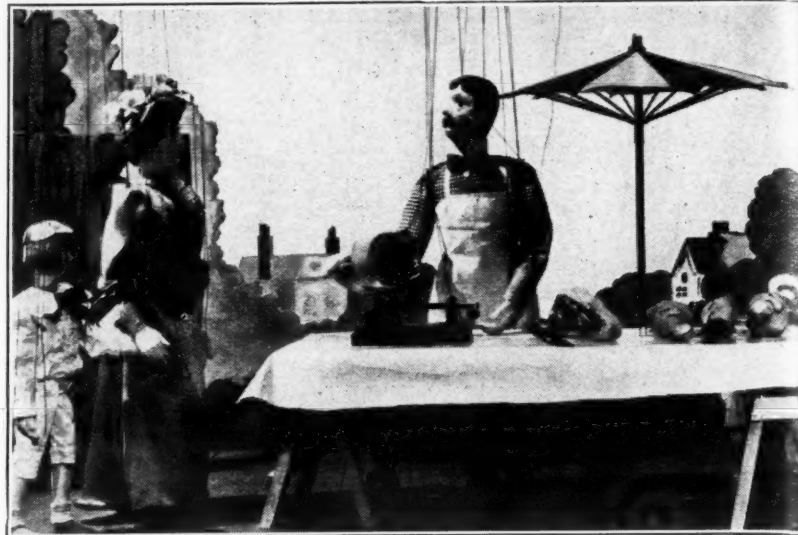
There are five stanzas in the Ford theme.

First, in an oldtime workshop of his own, Ford shows how each line of progress is dependent upon all the hundreds of others that collectively carry mankind forward. His example is a machine shop of 1850 wherein nobody, however great, even with a perfect conception of the modern automobile, could possibly have built it—too many factors were still missing, such as the electric system, the vulcanization of rubber, and so on. A collection of relics of Ford's early days and of the days and work of Thomas A. Edison also are shown.

Second, in the great central rotunda of the building, is displayed the famous Ford Drama of Transportation. Here 67 vehicles dating from the Egyptian chariot and coming down through the ages to the latest motor car are arrayed side by side in a graphic exposition that tells the story of the wheel and the road.

And surmounting all, a striking background to ancient broughams, sedans, stage-coaches and "two-lung-

'The World on a String'



Puppets which gesture and dance when their masters pull wires portray—in scenes like the above—the story of Refrigeration Through the Ages in an air-conditioned theater which is part of the Kelvinator exhibit at A Century of Progress exposition for 1934.

ers" of 1906 and 1908, is the world's largest photograph—in effect a single vast picture 600 feet long and 20 feet high, telling a part of the Ford world story. Some idea of the size of this photographic mural may be gained from the fact that it took 40 men a month to build it—that each single panel of its total of 97 weighs 400 pounds.

Third is the industrial exhibit. Housed in a hall nearly 600 feet in length, under a light more nearly approximating daylight at noon than has yet been achieved in artificial lighting, upwards of 40 manufacturing operations are shown, most of them lifted bodily from factories.

Instead of assembling parts into cars, the Ford exhibit starts with raw materials such as copper, iron, zinc, aluminum, rubber, cotton and wool and processes them through to the finished product. In each instance the source—the soil—is made clear, as well as the purpose to which the product is put, the reason for the use of each material.

A total of 289 master loudspeakers and 223 auxiliary speakers is employed in the sound system used by lecturers to explain the industrial exhibit to visitors. No speaker is of greater than three watts volume, so that none speak more loudly than a conversational tone, to give the illusion that no amplification is taking place. The whole system is centrally and automatically controlled so that no two speakers clash and none will blare. So intricately interwoven and so carefully adjusted is the system that four separate programs might be broadcast in the building simultaneously without one interfering in the slightest with any other.

The fourth stanza of the Ford theme is Mr. Ford's soy bean exhibit,

Mr. Friday



Gus Treffeisen, assistant to Charles D'Olive, manager of the Stewart-Warner refrigeration department, is Mr. D'Olive's Man Friday, and is a bear for detail.

an effort to show the farmers of America how to improve their income by growing and processing for industry one of the world's most ancient crops. Today all of the enamel used in the painting of Ford cars—and enamel is used exclusively instead of lacquer—has a soy bean oil base.

The horn button, the gearshift knob, the ornamental doodads on the door handles are made of soy bean meal, an excellent plastic. A half bushel of soy beans is in every Ford, a fact that is significant of the wider uses Mr. Ford sees ahead for this legume.

The little old white barn on the Ford homestead at Dearborn, built in 1863, the same year of Mr. Ford's own birth, has been dismantled, marked board by board and shingle by shingle, shipped to Chicago, rebuilt, and now stands just in the rear of Mr. Ford's own shop, surrounded by soy beans.

In the barn is the machinery Ford engineers have developed for the processing of soy beans—machinery which Mr. Ford insists any farmer might adapt to his own use and to his profit.

Fifth part of the exhibit is Ford Park and the "Roads of the World." The latter is an oval roadway broken into nineteen sections. Each section tells a story of highway history.

Here is a piece of road that might have been lifted bodily from the Appian Way of Caesar's time, another piece reproduces an ancient slab road of China, a third the famous Le Grande Corniche built by Napoleon in 1806 as he marched to the conquest of Italy, and so on. What is done in the Ford Drama of Transportation with vehicles is here done with roads, and over these roads Ford cars run, filled with visitors.

(Incidentally, the Fords, run on a smooth cinder roadway inside the replicas of ancient roads. It would be a good test of riding comfort to make them travel on the rough old roads).

The illumination of the Ford building required one hundred miles of wiring. More than 9,000 floodlights are concealed about the structure, none of them visible, yet each adding to the blaze of mobile color that bathes the building. The electric load of 6,000 kilowatts is more than a third of the total load used by the entire World's Fair last year.

One of the most sensational effects is a torch of light, 200 feet broad at its base, that under proper atmospheric conditions rises to the height of one mile.

A mammoth lighting scheme has been constructed on the outer edge of the central rotunda, which contains 22,000 lineal feet of lighting units. Control is through thermionic tubes and a dimming equipment that alone weighs 12½ tons and requires 20 miles of wiring.

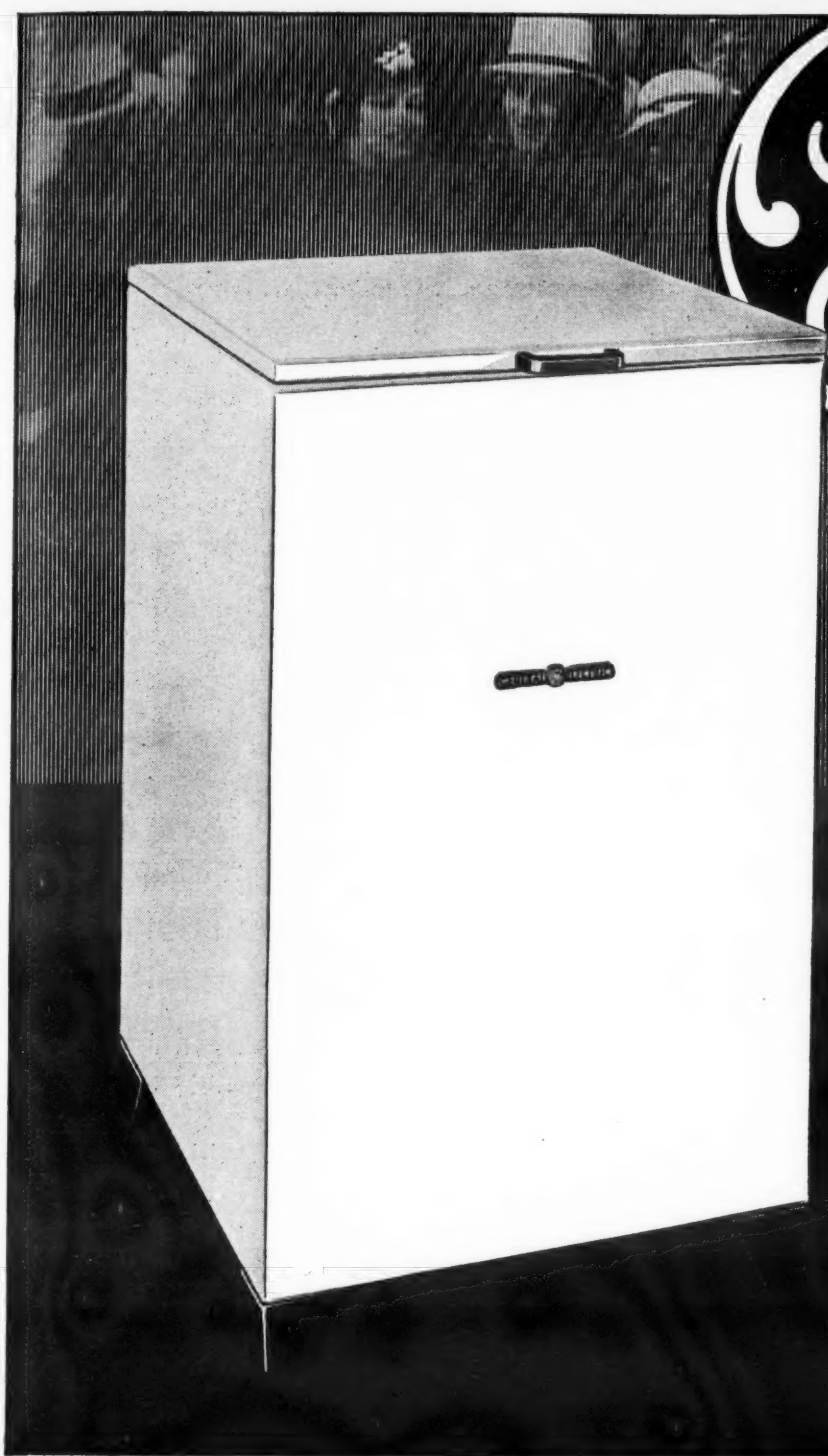
The Ford building was put together in a little more than three months. It was electrically welded.

General Household Utilities Distributors Descend on Marion, Indiana



When Vice President H. C. Bonfig of General Household Utilities wanted to get across to his distributors the story of "Signal Beacon" device on the new Grunow all-wave radios, he hired a special train and took the whole flock down to the General Household Utilities factory in Marion, Ind., where they are now running down the assembly line. These snapshots were taken when the train pulled back into Chicago on the return trip. The three alert and fully clothed gentlemen in the last picture are the three Brown Bros., Grunow distributors in St. Louis.

GENERAL ELECTRIC ANNOUNCES A REVOLUTIONARY NEW REFRIGERATOR



\$ 77⁵⁰
plus freight

FOR
and a Companion Range at \$72
plus freight

A TRIUMPH of General Electric research and engineering! An amazing new refrigerator and range at lowest cost in all G-E history! Daring in conception, revolutionary in design, the new G-E "Liftop" refrigerator is as epoch-making as the first G-E Monitor Top! The new G-E "Companion" range inaugurates sweeping new principles in electric range engineering. Now every wired home in America has open door to less costly and more luxurious living. Now electric refrigeration and electric cookery become universal conveniences!



HOLDS ALL THIS FOOD!

2 qts. milk	2 lbs. bacon	½ doz. oranges
2½ pts. cream	5 lbs. roast	1 jar salad dressing
1 doz. eggs	1 head lettuce	1 lb. lard
1 lb. butter	1 big cucumber	2 left-over containers
2 pkgs. cheese	2 lbs. tomatoes	1 qt. water bottle
2 cans fruit juice	1 bunch celery	2 quick freezing trays
1 bottle catsup	2 grape fruit	(20 ice cubes—
1 bottle cherries	2 lemons	2 lbs. of ice)



Lowest Operating Cost in the World!

The new G-E "Liftop" refrigerator has the lowest operating cost of any electric refrigerator in the world, with ample food storage capacity for the average family. Freezes ice faster—20 cubes (2 lbs.) at a time. It is powered with the famous G-E sealed-in-steel mechanism—the same principle as in the world famed Monitor Top—and requires no attention, not even oiling. All-steel cabinet, baked Glyptal enamel exterior, and stainless steel freezing shelf that cannot chip or rust. 5 years' protection on sealed-in-steel mechanism available at \$7 additional.

The New G-E "Companion" Electric Range

The new modernly styled, fully automatic G-E "Companion" range is most compact, yet has ample capacity for a family of eight. Unique design and construction give almost unbelievable speed and low cost in operation. Three surface units—one 8½ in. diameter, two 6½ in. diameter—each with control for high, medium and low temperatures. Spacious oven (14 x 18 x 18)

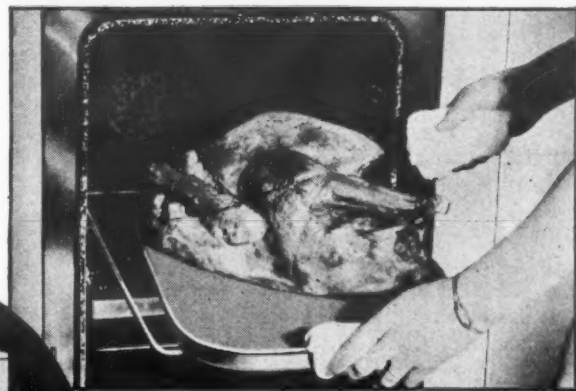
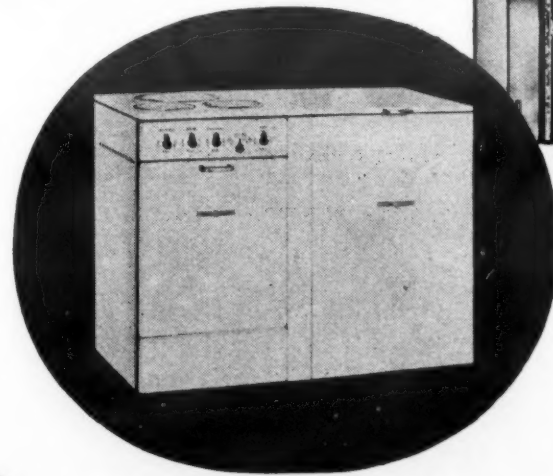
readily accommodates 15 lb. turkey. 3-speed oven unit and automatic temperature control. Finished top and front with stainless porcelain. Baked Glyptal enamel sides.

At their startling low prices and incomparable low operating costs, the new G-E "Liftop" refrigerator and "Companion" range are ideally suited for the home with reduced income, the small house with restricted floor space, the summer cottage, roadside stand, and for many other purposes.

Public preference for G-E quality in an electric refrigerator and range at these popular prices opens up a vast new market throughout America—a mass market amazingly rich in selling possibilities. Progressive retailers are invited to join with us in this great new sales program. Write or wire for details. General Electric Company, Specialty Appliance Sales Dept., Section DF71, Nela Park, Cleveland, Ohio.

Both for the price of one!

Designed for either separate installation or as one combined unit. Now both electric refrigeration and electric cookery are available at a price previously paid for **\$142⁵⁰** plus freight



● Unusually large oven (14x18x18) readily accommodates a 15 lb. turkey or bakes eight 1½ lb. loaves of bread at one time! Has ample capacity for a family of eight. Equipped with automatic precision temperature control so vital to good tasting foods.

There is a G-E Refrigerator model for every requirement—Monitor Top, Flat Top, Lift Top.

GENERAL ELECTRIC

MILK COOLING

Nicholas Explains Advantages of Modern Electric Milk Cooling

By John E. Nicholas, Associate Professor of Agricultural Engineering, Pennsylvania State College, State College, Pa.

MILK, which is one of our most important and perishable foods, requires extreme care in handling from the time it is produced until it is consumed. Experimental work shows that milk should be cooled as soon as it is drawn from the cow if its quality is to be maintained in its original state. The practice of cooling milk on the farm existed for many years, but present city milk markets are far removed and it is not unlikely that under certain conditions milk does not reach the central receiving stations until possibly 12 hours, and in some instances 24 hours, after it has been produced. It therefore becomes imperative that milk must be cooled and maintained cold at comparatively low temperatures to prevent the growth of the bacteria which initially occur or are introduced in the fresh milk.

45° F. Halts Bacteria Growth

Cooling milk to 50° F. will undoubtedly prolong its keeping quality to a great extent. More recent studies indicate that 45° F. might be called the "safety zone" because that is the temperature at which the original bacterial content of milk remains the same.

If milk is to be cooled to the safety zone of 45° F., it is impossible to have it cooled to this temperature by the older methods where the milk cans

were set in the available spring or a diverted portion of running water found on some farms.

Seldom does the spring water have low enough temperature in the summer to cool the milk even to 50° F.

Mechanical Methods

It is undoubtedly the summer season during which milk must be cooled quickly (and preferably to 45° F.), and it seems apparent that only some means of mechanical refrigeration will make this possible, either through the use of ice, gasoline engine or electrically operated milk-cooling unit.

When ice is used to cool milk it requires approximately 60 pounds of ice per day per 10-gallon can, provided the cooling is done in a well insulated tank.

If electricity is not available, a milk-cooling plant operated by a gasoline engine may be used. This requires constant attention of cranking at

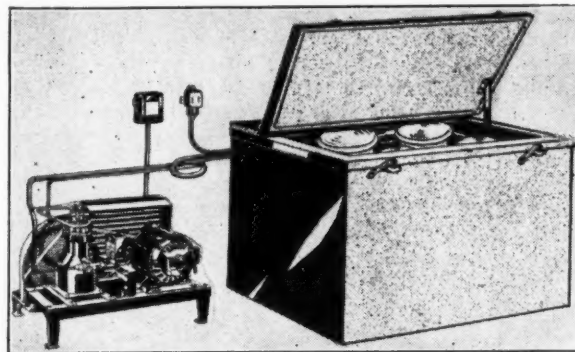


Fig. 1—Electrically operated milk-cooling unit with portable type of cabinet placed on floor of milk house.

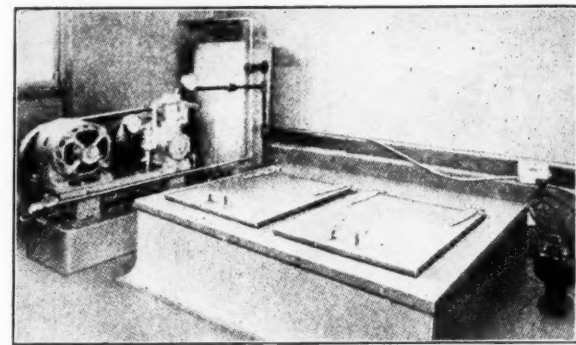


Fig. 2—Electrically operated milk cooler with built-in concrete cabinet placed partly below the floor line.

least twice daily, and supplying the fuel tank at regular intervals to keep the plant in operation.

Electrically operated milk-cooling plants offer a very satisfactory method in handling the cooling problem at the farm. Such plants are entirely automatic and if properly installed the only attention necessary is the filling of the small oil reservoirs for the motor which may be filled once a month.

Portable and Built-In Coolers

The most acceptable method of cooling the milk is by direct immersion of the milk cans into the cold water of an insulated tank. The tank is filled with sufficient clean water to submerge the milk cans at least one-half inch above the milk level. This water is kept cold by the electrically operated refrigerating machine.

Figures 1 and 2 illustrate two types of electrically operated milk-cooling plants. One shows a portable type of milk-cooling cabinet which rests on the floor of the milk house, the other is a built-in type made of concrete and placed partly below the floor line of the milk house.

Passage Over Aerator

In certain cases milk is cooled by passing it over the aerator. The cold water from the milk tank is pumped through the aerator and then returned to the tank into which the aerated milk is finally set. This is a questionable practice in view of the complete exposure of the milk to the dirt and bacteria-laden air during the cooling process and then placing it into the water which warmed up, not only by absorbing the heat from the milk, but also by the heat from the accessories which comprise the additional equipment.

In cooling milk by direct immersion it is a good practice to use no less than six gallons of cooling water to every gallon of milk cooled. The cooling water should be agitated during the first 1½ hours of cooling.

The agitation of the cooling water will assure a uniform cooling of the milk in the can, while a large water to milk ratio assures a rapid cooling of the milk to the desired temperatures.

Charts of Cooling

Fig. 3 shows how milk cools in a 10-gallon can when placed in a 36-degree water when the cooling water is not agitated. The bottom of the milk cools very rapidly. It would seem desirable that all of the milk be cooled uniformly, but experimental evidence proves to the contrary.

For example, at the end of an hour the bottom of the milk is about 42° F. while the top of the milk is still at 63° F.

If the cooling water is agitated (Fig. 4), however, the bottom of the milk at the first hour is nearly 40° F. while the top is 53° F. In the first cans the temperature difference was 21° F. and in the second can only 13° F.

Milk Warmer at Top

After two hours of cooling the milk is still 16 degrees warmer at the top than at the bottom without agitation. If agitation is employed the temperature difference is reduced to 5° F. with the top of the milk at 45° F. the safety zone temperature.

The agitation of the cooling water and the milk would undoubtedly cool the milk more rapidly and more uniformly, but the advantage thus gained would not compensate for the possible contamination of the cooling water and of the milk.

Agitator Shortens Cooling Time, Tests Show

MILWAUKEE—Tests recently conducted at the plant of The Haven Mfg. Co. here, manufacturer of farm milk coolers, have demonstrated that the use of an agitator or some instrument to propel the water in a wet storage type cooler shortens the time necessary to cool the milk properly.

According to P. W. Hasler, president of the Haven company, a Haven unit operating from a ½-hp. refrigerating unit will cool four 10-gal. cans of milk from cow heat or 93° F. to 50° F. in one hour, but that with an agitator, this cooling can be accomplished in less than 40 minutes.

Self-Contained Milk Cooler Developed By Haven Co.

MILWAUKEE—Haven Mfg. Co. this year is offering a farm milk-cooling unit with compressor, motor, and cooling coils available in one piece. It can be had with either an electric motor or gasoline engine.

Haven coolers are made in sizes to cool any number of 10-gal. milk cans up to 14. The Haven company furnishes tanks built to operate with its cooler in sizes up to 12 cans.

The condensing unit and motor are mounted over a portion of the cover of a cooling tank, with cooling coils mounted underneath and surrounded by a perforated metal guard.

When the lower part is immersed in a tank of water it cools the water and freezes a block of ice outside the coil guard surrounding the coil. The cooling unit is completely self-contained, and needs no connection pipes.

The unit is free of the tank itself, and with this type of mounting it is easy to raise the unit and clean the tank thoroughly without disturbing the mechanism or disconnecting any part of the cooling unit.

The machine itself can be cleaned by merely tipping it forward so a brush or rag can be inserted from below.

Condensing units employed in the operation of the Haven milk cooler are specially designed compact refrigerating machines in sizes up to ¾ hp., which Haven Mfg. Co. makes itself.

Mexican Creamery Uses Modern Units For Milk Cooling

MEXICO CITY, Mexico—Sweet cream for the Muzquiz Creamery here, which sells only butter, is produced on two haciendas located in northern Mexico, which have been equipped with Kelvinator commercial refrigeration equipment.

The Muzquiz plant here is also Kelvinator equipped. The milk is cooled first at the haciendas and then is shipped in big thermos bottles to the creamery. Upon arrival it is immediately placed in a walk-in cooler where a 40° F. temperature is maintained. The butter made from this cream is kept in a large storage cooler in which the temperature is held to 16° F.

Refrigeration for both of these coolers is supplied by Kelvinator forced convection systems. A brine tank is also used to produce about 400 lbs. of ice daily.

One 2-hp. condensing unit is connected to a submersion type coil and to the two convectors in the cream storage room. A 3-hp. unit serves another submersion coil and the two convectors in the butter storage room.

Defrosting is accomplished in the butter room by pumping hot refrigerant from the compressor into one convector while the other convector is evaporating the refrigerant.

The installation was made by Enrique Huber, manager of Enrique Huber, Inc.

Comparison of Cooling Time

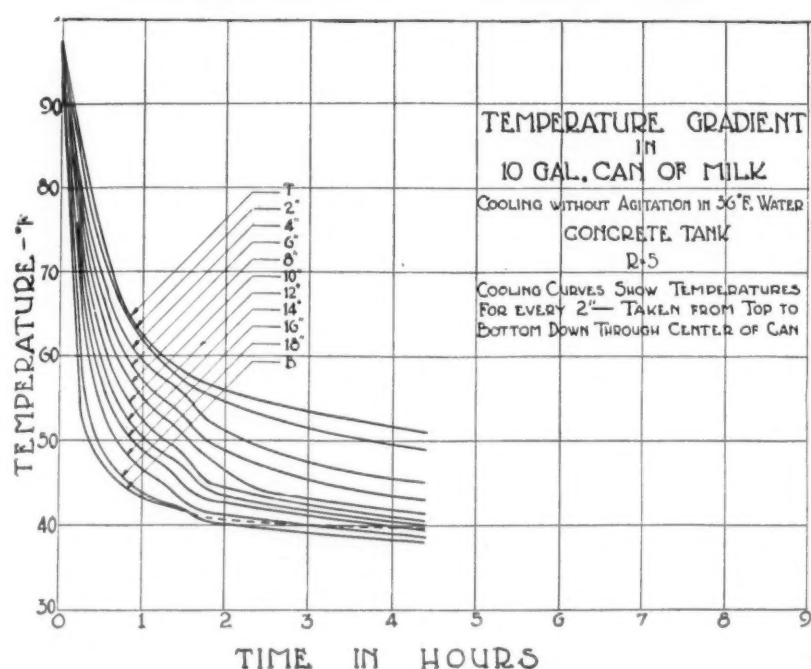


Fig. 3 shows the rate at which the milk in the top and bottom of a 10-gal. can cools when the water bath is not agitated.

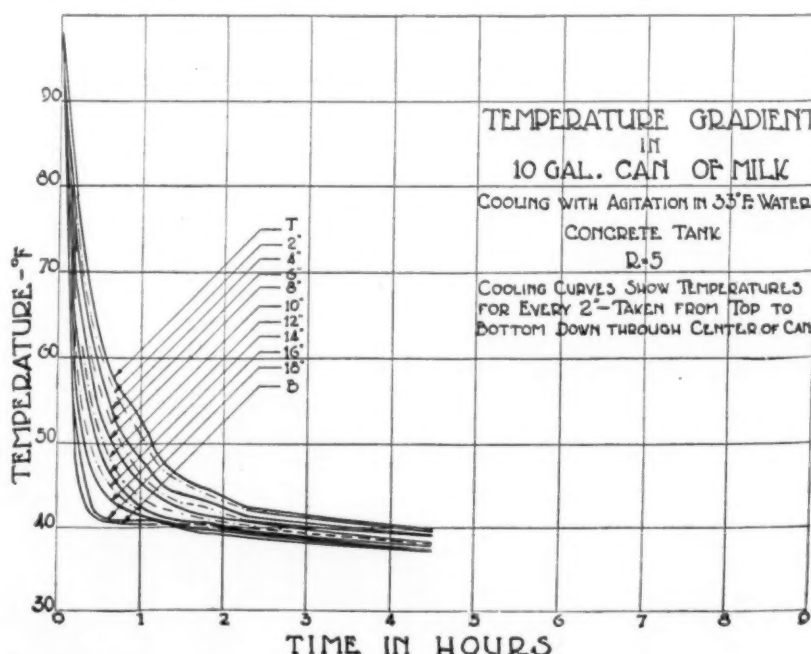


Fig. 4 shows the rate at which the milk in the top and bottom of a 10-gal. can cools when the water bath is agitated.



for Refrigeration Service

SILENCE—the watchword of refrigeration engineers—is built into Bulletin 709SP Single Phase Starters. The switch mechanism floats in rubber! No hum can reach the cabinet—no compressor pulsations can affect the mechanism. It's quiet—it's dependable!

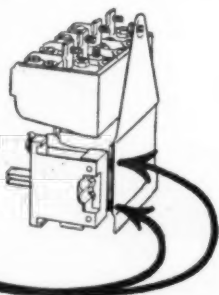
You can use the 709SP for either 110 or 220 volt single phase motors—merely change starter connections, that's all.

Accurate overload relays do away with fuses—they are tamperproof and troubleproof. And the switch contacts are made of a special silver alloy—they require no attention, even after long service.

Every engineer and contractor dealing with refrigeration and air-conditioning problems needs Bulletin 709SP with dimensions and prices. Write today!

Allen-Bradley Co. 1313 S. First Street
Milwaukee, Wisconsin

MOUNTED IN RUBBER



ALLEN-BRADLEY
A. C. AUTOMATIC STARTERS



*I'm a Prospect
for a Leonard
Refrigerator*

**In 6 weeks this
happened
14,500 TIMES**



Thousands of prospects—EVERY WEEK—are flocking to Leonard showrooms, under the Floor Selling Plan

In the first six weeks that it was in operation this spring, the Leonard Floor Selling Plan brought 20,400 women *into the showrooms* of Leonard dealers and *into contact* with Leonard salesmen. The figures are based on partial reports from only a fraction of Leonard territories.

But that is not the amazing thing about this great sales promotion program, the only one of its kind in the industry. Two out of every three of these women—14,500, to be exact—signed their names and addresses as actual prospects for Leonard refrigerators.

Day by day, the figures are mounting and the

evidence of spectacular success becomes more convincing—as Leonard dealers from coast to coast swing into action behind the plan.

Backed by a splendid product and strong supporting advertising, this unique sales help is breaking all Leonard records for retail volume. Can you afford to be without a plan that "short-cuts" the selling process—not only finds prospects for you, but actually brings them into your store to hear the Leonard story? Write or wire, and we will gladly give you complete details. . . . LEONARD REFRIGERATOR COMPANY, 14256 Plymouth Road, Detroit, Michigan, and London, Ontario, Canada.



THE COMPLETE REFRIGERATOR

offers these, and a score of other, great sales advantages

LEN-A-DOR—Leonard's famous self-opening, step-saving door.

Cabinets of beautiful design, superior finish and quality construction.

Planned interior, with unusual shelf area and storage capacity.

New service tray, sliding and adjustable shelves.

Improved dairy basket with bottle container; vegetable crisper; electric light.

12 freezing speeds, extra fast freezing tray, cold chest, "vacation temperature," ice tray lifter.

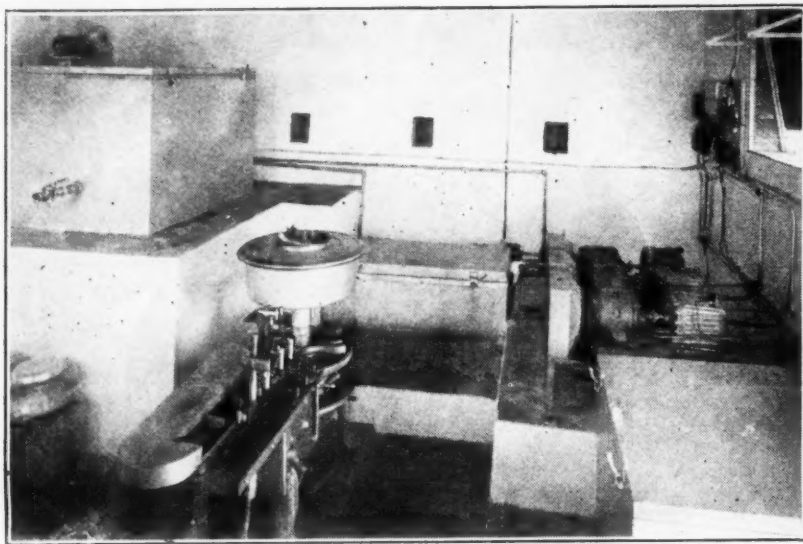
All-porcelain interior, all-porcelain cooling unit, refrigeration mechanism backed by 20 years' experience.

LEONARD

THE COMPLETE REFRIGERATOR

MILK COOLING

Cooling Equipment for 'Model' Dairy



Milk-cooling room on Dr. Allerton's farm showing (starting at right-hand corner and going counterclockwise around the room) a dry cooler, three Haven condensing units, brine tank with circulating pump, 600-lb. ice maker, and the holdover cooler.

Binghamton Doctor Installs Haven Milk Coolers in 'Perfect' Barn

BINGHAMTON, N. Y.—When a fire last year destroyed the farm buildings on the property owned by Dr. S. M. Allerton, whose hobby for the past 15 years has been the production of high-grade milk, it gave him an opportunity to plan and construct the "perfect" dairy barn for the production of quality milk.

Modern electrically refrigerated milk coolers have an important part in the new model dairy farm which Dr. Allerton has developed.

Two most noteworthy features of Dr. Allerton's farm are: first, the milking parlor, which is a milking room separated from the barn proper, making it possible to produce the milk under the most sanitary conditions; and second, the milk room with a complete refrigeration plant that cools the milk quickly to 40° F. or less.

The refrigeration equipment installed consists of three ¾-hp. Haven direct-driven condensing units, a holdover tank, a brine tank, an ice maker, and a dry cooling cabinet.

The principal unit in this assembly is the holdover tank, which has a capacity of 480 qts. of milk. This is cooled by circulation of brine from the brine tank. However, this holdover tank is also provided with direct expansion cooling coils so that after the milk is cooled it will not be necessary to start the brine circulation to hold the temperature of the brine tank.

Three compressors have been installed so it will not be necessary to operate the entire capacity of the plant when only a small amount of refrigeration is required. One compressor is connected to the dry cooler and to the coils in the holdover tank. In both cases, it merely serves to

hold the temperatures to a point below 40° F.

The heavy part of the refrigeration load is handled by the other compressors, which are hooked up in tandem and are connected to the brine tank and the ice maker. Temperature control is automatic with Penn controls, but each compressor has its own starting switch, so that any compressor may be cut out when the load is light.

Kelvinator Produces Gasoline-Driven Condensing Unit

DETROIT—A gasoline-driven condensing unit, adapted to the needs of milk producers who do not have suitable electric service, has been added to Kelvinator commercial line.

The new unit, the ¾-hp. model F175, is intended chiefly for use with a 1½-hp. gasoline engine in submer-sion-type installations.

Tests with the equipment have established a definite rating of 16 10-gal. cans cooled from 70° F. to 40° F. or 10 cans from 95° F. to 40° F.

Duncan Made Member of Freezer Code Authority

WASHINGTON, D. C.—D. J. Duncan, professor of marketing, Northwestern university, has been named administration member to the code authority for the counter-type ice cream freezer industry.

Waukesha Combines Agitator & Cooler

WAUKESHA, Wis.—Waukesha Motor Co. this year has introduced a self-contained combination milk-cooling unit and agitator, which operates with either a gasoline engine or electric motor.

As shown in the illustration, the power plant with the compressor is built as a single compact unit with the condenser placed on, the receiver at the side, all mounted upon a steel pan 18 in. square. A protecting hood about the same height covers the power unit.

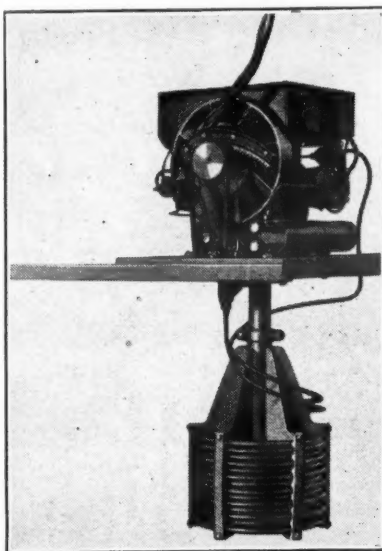
From the lower side of this base is suspended the evaporator coil wound on a spider so that it is the same size and shape as a 10-gal. milk can. The tube supporting the spider houses the vertical agitator shaft with stainless steel bearings running in graphite bronze supporting bushings.

On the lower end of the agitator shaft, and in the center of the cooling coil, is placed the agitator shaft itself. This is power driven from the engine and circulates the sweet water at all times when the cooling unit is in operation.

To make the unit universally adaptable to tanks of varying depths, the spider upon which the evaporator coil is wound is adjustable, and can be moved up or down through a range of about 10 in.

For supporting the unit, a pair of angle irons attached to either side of

In One Piece



Waukesha self-contained unit and agitator with hood removed from gasoline engine and compressor.

the base are supplied which span the top of the cooling tank, and hold the evaporator immersed directly in the water bath. It is unnecessary to fasten these angle irons in place as the weight and balance of the unit hold it in place.

The gasoline engine employed is a single-cylinder, four-cycle, air-cooled unit with bore and stroke of 2½ in., developing three-quarters of a horsepower or more in milk-cooling service. Directly connected and driven by the engine from an extension of the camshaft is the compressor which runs at half engine speed with 2½ in. bore, but only an 1½-in. stroke.

The flywheel combines the cooling fan which serves both the engine and compressor as well as the condenser, the air stream being divided by shrouding so that each of the three units gets its cooling independently. The governor which controls the engine speed is also actuated by the air current from the fan type flywheel while the ignition is secured from the high-tension magneto housed in the flywheel center.

The Waukesha milk-cooling unit will also operate with a ½-hp., 110-220 volt, 60-cycle, single-phase repulsion induction unit.

In performance the unit, operated for an hour, is said to produce the same effective refrigeration as 20 lbs. of ice. Thus if a farmer requires 300 lbs. of ice a day for milk cooling, the operation of the unit for 15 hours will provide equivalent cooling.

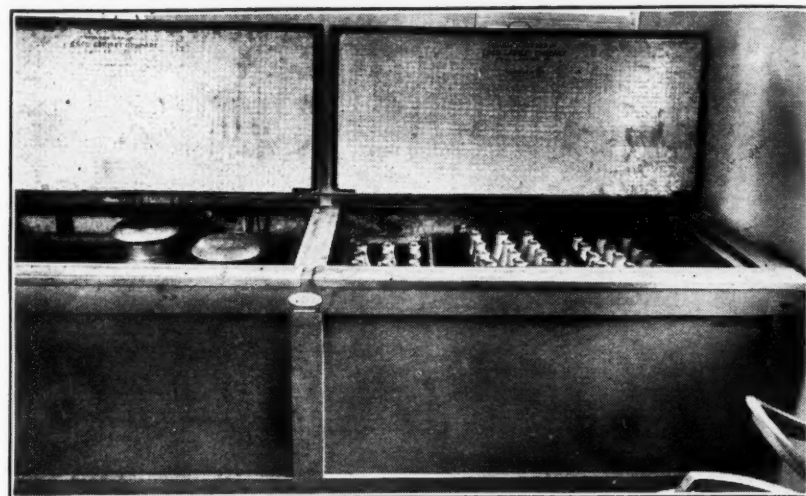
The agitator affords directional circulation of the water, bringing the cool water to the surface where it strikes the warmest milk, chills it, and causes it to settle to the bottom, thus setting up an automatic self-stirring action.

The ease with which the cooling unit can be lifted entirely out of the milk-cooling tank, makes cleaning easy.

Northey to Distribute Commercial Lines

WATERLOO, Iowa—Just organized here to distribute domestic and commercial refrigeration, beer-dispensing equipment, and butchers' supplies is the Northey Refrigerator Co. Fred L. Northey is manager, and R. E. Northey, secretary. The new firm is headquartered at 410 Sycamore St.

Cools Milk in Cans and Bottles



Pictured above is the Esco combination wet and dry storage milk-cooling cabinet installed on the Marshall Vale farm in Delaware.

Fleetwood Develops 'Streamline' Cooling Unit for Wet Storage Milk Coolers

NORRISTOWN, Pa.—A new "streamlined cooling unit" for use in wet storage type milk coolers, embodying a combined water circulator and evaporator, has been introduced by Fleetwood Products Co. of this city.

This unit is so built that it may be installed in any insulated cabinet or cement trough. In operation, the small circulator moves the hot water from around the top of the milk cans and forces this warm water in a very thin stream over refrigerated surfaces in the bottom of the unit.

These refrigerated surfaces are so arranged that the water must travel back and forth the length of the cooling unit several times, thus insuring rapid cooling of the water bath.

Fleetwood officials claim that in

seams are joint soldered and the bottom is protected by a galvanized steel grid.

This grid is of open construction, which allows a free flow of water under the cans, keeping the tank in a sanitary condition.

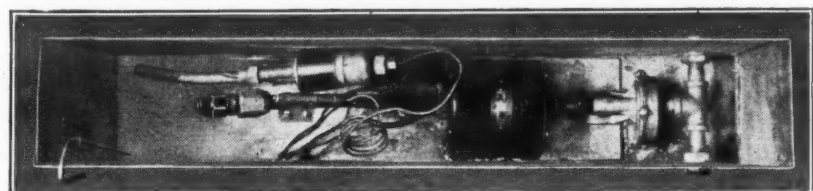
Hair insulation is used throughout the cabinet. The sterilized deodorized hair is treated and compressed into board form which is sealed with hydrolene to the outer and inner walls of the cabinet.

Top of the cabinet walls are protected by a heavy steel channel, under which is a live rubber breaker strip.

Following data was obtained from an operating test recently made with a Fleetwood cooler:

Two 10-gal. cans were cooled from 95° F. to 50° F. The cooling unit was

'Streamline' Milk Cooler—from the Top



Top part of Fleetwood cooling unit showing controls and circulating pump. Water is cooled by refrigeration coils in bottom section.

actual operation it is possible to cool cans of milk to a temperature of 50° F. in one hour or less. Another advantage claimed for the Fleetwood milk-cooling unit is that the difference in temperature between the top and the bottom of a can of milk when cooled by the Fleetwood cooler does not vary more than 1½ to 2° F.

The Fleetwood cooler operates with high suction pressures. In tests the evaporator has been operated at a temperature of 32° F., with a surrounding water bath of 36° F. Throughout the cooling cycle a differential of 6° F. between the refrigerant and water bath is maintained.

The cooling unit operates automatically with thermostatic controls. Space is provided in the top of the unit for all refrigeration connections (see illustration) and control valves completely isolating these parts from possible contact with the water bath.

The Fleetwood milk-cooling cabinet is built of steel. Exterior is of rust-resisting steel, while the inner lining is made of galvanized steel. All

operating in conjunction with a ½-hp. condensing unit, rated at 2,215 B.t.u.'s per hour. Detroit controls were used.

The milk was cooled to 50° F. in approximately 50 minutes. Compressor running time to provide and maintain a temperature of 36° F. in the water bath was three hours and 30 minutes (room temperature 74° F.).

Electrical consumption was 525 watts per hour, including the circulator, which consumes an average of 50 watts per hour.

New England Colleges Use Kelvinator Milk Cooler

BURLINGTON, Vt.—Recent Kelvinator installations for milk cooling experimental purposes in colleges located in northeastern states include those at the University of Vermont, Burlington; Connecticut Agricultural College, Storrs, Conn.; Massachusetts Agricultural College, Amherst, Mass.; and at the University of New Hampshire, Durham, N. H.

The RANCO THERMOSTAT for 1934

is the mechanical marvel that assumes all the worries of having to watch the refrigerator when defrosting to completely defrost the evaporator and still preserve the foods in the cabinet. At the proper time the thermostat switches to a normal refrigeration cycle.

THE AUTOMATIC RECLOSING CIRCUIT BREAKER COMPANY
1300-10 Indianola Avenue, Columbus, Ohio

ANSUL SULPHUR DIOXIDE For dependable refrigeration

ANSUL CHEMICAL COMPANY
MARINETTE WISCONSIN

Complete refrigeration satisfaction depends a lot upon the quality of the sulphur dioxide used. Specify Ansul, the sulphur dioxide in individually analyzed cylinders and be certain of dependable refrigeration always.

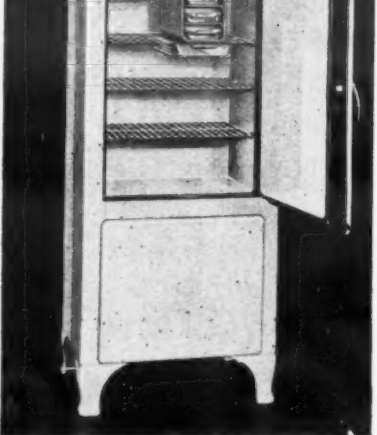
ANSUL METHYL CHLORIDE Available in any quantity, spot or contract shipments. Every container is laboratory tested to insure low moisture and acid content.

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

In Tune With Distribution

Any scheme of merchandising refrigerators which does not consider the interest of the distributor is fore-doomed to failure. The man who is the actual seller of the merchandise is informed as to customer likes and dislikes. He knows the refrigeration business by personal contact with actual users and his recommendations had better be carefully considered, or else . . .



Copeland Domestic Refrigerators: Made in seven models 4, 5.4, 6.5, and 7.6 cu. ft. net storage. Porcelain and Porceloid finishes. Copeland Commercial Units, 21 model, 1/6 to 3 H.P.

At the Copeland plant we consider the distributor the final word in matters relating to public acceptance. We are guided in matters of styling, equipment, sizes and list prices by our many good friends on the firing line.

Copeland has always attracted responsible, intelligent and aggressive representation because it has, consistently

1. Made an efficient product—styled to attract popular preference—priced at reasonable figures
2. Allowed "living" discounts
3. Practiced ethical trade principles
4. Furnished effective co-operation.

Distributors who are looking for an opportunity to better their position will be well advised to consult Copeland. There is both Profit and Pleasure in a Copeland connection.

COPELAND REFRIGERATION CORP., Mount Clemens, Mich.
Division of Winslow-Baker-Meyering Corp.

Cooper Winners in Contest Honored

CHICAGO — R. Cooper Jr., Inc., Chicago General Electric distributor, was host at a breakfast meeting June 22 at the Knickerbocker hotel here at which prizes were awarded to Chicago district winners in the G-E "All Star Discovery Drive" contest.

A. A. Uhalt, manager of the dealer division of the Specialty Appliance Sales Department of General Electric Co., was principal speaker at the breakfast. A new "baseball" contest, starting June 22 and ending Aug. 4, was also announced.

Following members of the Cooper organization were awarded a trip to Cleveland:

W. M. Scanlan, B. A. Salava, M. W. Ellen, L. B. Williams, H. G. Finn, E. Dillon, J. F. Zander, Guy Parker, J. Nolan, Leslie Eme, Steve Maker, W. R. Burns, R. L. Weinman, E. M. Brady, A. C. Ahrendt, L. J. Baron, H. Van Schaack, S. J. Showalter, L. F. Meinert, H. J. Turnbull, J. F. Grant, E. R. Aud, E. Munger, J. Utaski, R. J. Kristufek, C. V. Yelton, O. H. Reiman, J. Ryan, E. W. Parish, H. Tattersfield, Wm. R. Baker, P. F. Wegner, H. F. Arnold, Leo Spero, T. Krueger, G. H. Fruetenicht, W. C. MacDonald, W. J. Lynch, Public Service Co.; R. E. LaNau, Public Service Co.; C. J. Haried, Haried Home Appliance; John Hackler, Hackler Bros.; J. H. Waibel, Waibel Elec.; Howard Torrance, Riverside Elec.; H. Siff, Commonwealth Edison Co.; B. B. Fenchel, Commonwealth Edison Co.

Winners of cash awards are as follows:

George Hunt, store No. 6, \$600; John Duncombe, store No. 7, \$450; D. MacGillivray, store No. 2, \$450; Will Snyder, store No. 3, \$450; Ray Henkel, store No. 5, \$450; R. R. Lowell, store No. 8, \$150; Fred Mackie, apartment house division, \$50; Harry Cagney, main office sales, \$35; William Leahy, main office sales, \$25; E. W. Parish, wholesale division, \$400; Public Service Co., \$100; Illinois Power & Light Co., \$75; Commonwealth Edison Co., \$155; Haried Home Appliance, star dealer class "A," \$100; Dreyfus Electric, second in class "A," \$50; Riverside Electric, third in class "A," \$25; Hackler Bros., star dealer class "B," \$75; Titus Bros., second dealer in class "B," \$50; J. H. Waibel & Sons, star dealer class "C," \$25; L. C. Kohlman, commercial department, \$825.

Non-selling employees: John Joyce, warehouse, \$15; Edith Wenstrom, store No. 3, \$15; W. R. Hadac, credit department, \$10; E. Rubaskin, main office sales, \$10; Kathryn Henry, accounting department, \$10.

Winners of G-E award of achievement—a gold watch:

R. L. Weiman, star division manager; S. J. Showalter, star district representative; Steve Maher, star apartment house representative; H. F. Arnold, star wholesale contact man; Leo Spero, star commercial salesman; W. C. MacDonald, star water cooler salesman; W. J. Lynch, star public service utility supervisor; R. E. LaNau, star utility salesman; J. H. Waibel, star dealer; Howard Torrance, star dealers salesman class "A;" Herbert Koepke, star non-selling employee.

Potter Holds Small Dealer Meetings at Factory

BUFFALO — Potter Refrigerator Corp. has been holding a series of small, two-day dealer group meetings at the firm's headquarters here, for the purpose of interchanging ideas on refrigerator sales activity.

According to Irving R. Halsey, assistant to the president, these meetings are limited to 10 or 15 dealers (never more than 20). Many dealers have expressed the feeling that such meetings are much more beneficial than larger sales conventions and are seeking to have these small group meetings made a regular and established tradition, according to Mr. Halsey.

C. W. Johnston Attends Rotary Convention

DETROIT—Charles W. Johnston, general manager of the Virginia Smelting Co., attended the convention of Rotary International here last week as a delegate from Portsmouth, Va.

Mr. Johnston is a past president of the Portsmouth Rotary club. His visit here marked the ninth Rotary International convention which he has attended.

Universal Cooler Equips Neurological Institute

MONTREAL, Canada — Universal Cooler refrigeration equipment has been installed in the recently erected building here which houses the Neurological Institute of McGill university.

The installation was handled by McDonald & Willson Co., Ltd., of Montreal, distributor for Universal Cooler Co. of Canada, Ltd., Brantford, Ont.

Leonard's Film Draws Crowds in Carolina

CHESTER, S. C.—One person from every 3.3 families residing here saw the Leonard Refrigerator Co. promotional sound film, "Gentlemen Prefer Beef" when it was exhibited here by the Chester Furniture Co., local Leonard dealer.

In the town of 760 families, a total attendance of 232 persons was recorded.

The furniture firm made certain that every one of Chester's 760 families knew about the coming of the movie. Newspaper advertising, personal contacts, handbills, and a telephone canvass publicized the show 100 per cent.

For the convenience of mill employees, one morning presentation of the movie was given.

Fair Exhibit Sells Electric Kitchen

CHICAGO—Fred Ramsdell, in charge of kitchen appliance sales for R. Cooper Jr., Inc., reports sales growing out of General Electric's kitchen exhibit at A Century of Progress.

Mrs. Brown of Rochelle, Ill., a General Electric refrigerator and range owner, after seeing G-E's model kitchens at the Fair last September, requested that plans for a complete G-E kitchen be drawn for her home. Plans were submitted but shortly thereafter she left to spend the winter in California and negotiations were dropped. Upon her return this spring, Salesman Joe Patterson, Rockford, Ill., contacted her and sold her a model E dishwasher with special cabinets and a ventilating fan to complete her G-E kitchen.

NRA Denies Change in Ice Code Clause

WASHINGTON, D. C.—National Recovery Administrator Hugh S. Johnson has denied a request by Huston Thompson, representing The Cooperative League, The Refrigerating Machinery Association and Joseph Zuccare, for elimination from the code of fair competition for the ice industry of its so-called "control of production" clause.

The clause in question provides that before additional ice production or storage may be established in any given territory, the party proposing such increase must first establish to the satisfaction of the administrator that public necessity and convenience require such additional capacity.

In opposing the request for elimination of this provision from the code,

The Code Authority pointed out to the administration that sales of ice had declined from 64,565,000 tons in 1921 to 40,280,000 tons in 1933, while the productive capacity of the industry had increased 12,728 tons during the years 1932 and 1933 alone.

Today, the ice industry as a whole is operating at approximately 60 per cent capacity of usable plants, according to figures submitted by the Code Authority.

D. P. Heath Joins Staff of McCord Radiator Co.

DETROIT—D. P. Heath, consulting engineer of this city, has joined the McCord Radiator & Mfg. Co. as assistant to J. D. Harris, chief engineer of the company. Forest W. McMillan, heat transfer engineer of the same company, has been assigned to McCord's refrigeration division to work with R. H. Hyde, sales engineer.

HOW TO KEEP SALESMEN HAPPY

IT'S GREAT THE WAY YOUR SALES ARE GOING UP, BILL. WANT A TIP THAT WILL SEND THEM STILL HIGHER?



ALL RIGHT, IT'S THIS. FEATURE FLEXIBLE RUBBER TRAYS AND GRIDS EVERY CHANCE YOU GET THEY'RE GREAT TALKING POINTS.



THINKING ISN'T ENOUGH. PLAY THEM UP FOR ALL THEY'RE WORTH. AND THEY'RE WORTH A LOT-- BOTH TO YOU AND THE PEOPLE WHO USE THEM.



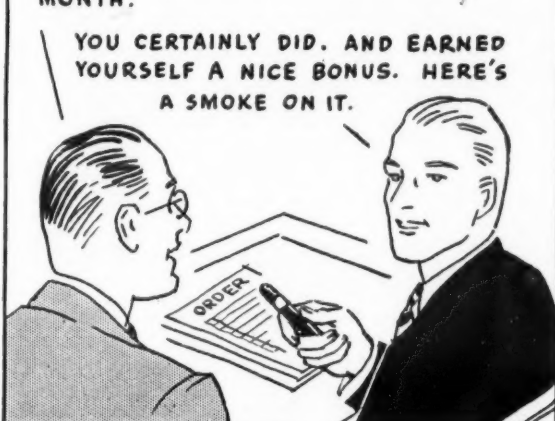
OKAY, BILL. AND HERE'S SOMETHING ELSE. USE THEM AS DOOR OPENERS ON COLD CANVASSING. OFFER THEM TO USERS AS PREMIUMS FOR THE NAME OF PROSPECTS WHO BUY. YOU CAN GET LOTS OF GOOD LEADS THAT WAY. TRY IT FOR A MONTH AND SEE.



ONE MORE THING, BILL YOU DIDN'T MAKE THE BONUS CLASS LAST MONTH. BY MAKING THE MOST OF FLEXIBLE RUBBER TRAYS AND GRIDS YOU OUGHT TO GO OVER THE TOP FOR A BONUS REGULARLY.



MONTH LATER YOUR TIP ABOUT FLEXIBLE RUBBER TRAYS AND GRIDS WAS A WINNER, CHIEF. I HAD A BIG INCREASE THIS MONTH.



It will pay you to insist that Flexible Rubber Trays and Grids be included as standard equipment in every model of the refrigerator you sell. By so insisting, you'll sell more refrigerators—and sell them easier.

Flexible Rubber Trays and Grids make Good Salesmen Better

There's no magic about Flexible Rubber Trays and Grids. They won't turn a poor salesman into a star performer overnight. But all other things being equal, the refrigerator so equipped is easier to sell than the one that isn't.

It's easy enough to understand why this is true. Among refrigerator owners there's practically a universal desire to have them. Witness sales during the past year when more than a million were sold. In fact, the demand for Flexible Rubber Trays and Grids has become so great that 90% of all refrigerators manufactured in

1934 will have them as standard equipment.

This summer, Inland advertisements—278,000,000 of them—will appear in leading National Magazines. Obviously the demand for Flexible Rubber Trays and Grids will increase still further.

So if you want to see all your salesmen do a better job, insist that every model of the refrigerator you sell has Flexible Rubber Trays or Grids as standard equipment. Write to the manufacturer of your refrigerator—or direct to us—for full details.

THE INLAND MANUFACTURING COMPANY, DAYTON, OHIO

Flexible Rubber Trays and Grids

ICE CUBES... INSTANTLY... TRAY TO GLASS

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office
Copyright, 1934, by Business News Publishing Co.
Published Every Week by

BUSINESS NEWS PUBLISHING CO.

5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.
Production Dept., 550 Maccabees Bldg., Columbia 4245.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: \$3.50 per year; 2 years for \$5.00. Canada: \$6.00 per year (due to special tariff). All Other Countries: \$5.00 per year (U. S. Money)

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EDITORIAL AIMS

To encourage the development of the art.
To promote ethical practices in the business.
To foster friendly relations throughout the industry.
To provide a clearing house for new methods and ideas.
To broadcast the technical, commercial, and personal news of the field.

VOL. 12, No. 10, SERIAL No. 276, JULY 4, 1934

Consumers Research On Refrigerants

CONSUMERS RESEARCH, a membership corporation with headquarters at Washington, N. J., has issued a "Handbook of Buying" Volume IX, part 3, dated May, 1934, in which columns No. 127, 128, 129, and 130 (pages 25 and 26) are devoted to confidential information on the dangers of refrigerant gases used in household machines, with advice to purchasers. ELECTRIC REFRIGERATION NEWS is credited as the source of some technical information, and is the only publication referred to in the bulletin.

As in the case of other bulletins of Consumers Research dealing with electric refrigeration, this report is a sort of hodgepodge of so-called information, some contemptuous allusions to manufacturers and business in general, and some rather silly recommendations to purchasers.

For example, the buyer is advised not to buy any refrigerator without obtaining from the dealer, and if possible from the manufacturer as well, in writing, and over the firm's official signature, the proper chemical (technical or scientific) name of the refrigerant used, a statement of the existence or non-existence of a warning odor and a degree of toxicity of the gas in correct technical terms and then to "consult with any available college or high school teacher of chemistry or write to your state university for a competent judgment on the information which the dealer or manufacturer, or both, has given you."

According to the bulletin: "Many more instances of damage from chemical refrigerants have taken place than have come to general public knowledge. Families have been routed from their homes by escaping gases, and life-saving squads of various city fire departments have been called upon to succor the victims. The cases already reported have not received the attention they warrant from the authorities." In referring to methyl chloride, the statement is made in the bulletin that: "Ten deaths were caused by this gas in Chicago a few years ago."

Certainly the "authorities" did not neglect the situation in Chicago during the summer of 1929 when Health Commissioner Arnold H. Kegel, past master in the arts of publicity, got the idea that leaking refrigerant from a multiple system was responsible for the death of a family of three. Everybody in Chicago and most of the Middle West heard about that case. All of the public hearings, the expert testimony, the demonstrations and arguments were reported in detail in ELECTRIC REFRIGERATION NEWS. The present editor of this paper practically lived in Chicago all that summer.

Considering all of the evidence, we were pretty well convinced that the refrigerant, great quantities of which had leaked into the small

apartment over a period of several days, was responsible for this particular tragedy. For several weeks after that accident, it seemed that almost everyone in Chicago who got sick blamed it on the refrigerator, but this sequence of events was obviously due to the publicity.

The Consumers Research handbook does contain two paragraphs of advice which are good. They read as follows:

"1. An increased risk of mechanical defects and leakage of refrigerant may be assumed to go with cheaply-constructed refrigerators (which are usually lower-priced).

"2. The buying of second-hand mechanical refrigerators involves greater risk in regard to leakage than purchase of a new machine."

The best laugh in the article is as follows:

"Remember the repair man will seldom know, if ever, the dangerous nature of these refrigerator gases (although gas masks—not featured in the sales literature—are provided by some companies for their service men)."

The handbook is available only to subscribers who are required to sign a promise that the confidential information issued by the concern will not be made available to outsiders.

In the issue of May 18, 1932, ELECTRIC REFRIGERATION NEWS reprinted one of these "confidential" bulletins in full with comment on the activity of the organization. The result was a number of threatening letters from an attorney for Consumers Research. Insistent demands were made that this paper reveal the name of the subscriber who had furnished the information.

So far as we have been able to determine, there is no legal basis for the protection of information which is widely distributed. The copyright laws of the United States are designed to protect authors' rights; but of course copies of a publication must be filed with the Register of Copyrights (thus made public) in order to secure the advantages of these laws.

It is true that the law does recognize the confidential nature of certain kinds of documents and communications, but it is our understanding that this protection does not accrue to a publisher who sells or distributes uncopyrighted material at a price to the general public.

The "confidential" feature of the Consumers Research plan, according to the best opinion we can develop, is designed primarily to protect the organization from suits for libel, slander, and defamation. We are not aware as to whether this subterfuge for avoiding legal responsibility has proved effective after a trial in the courts. We will appreciate information on this subject. It is quite evident, however, that Consumers Research is quite determined in its attitude to "expose" the real or fancied crimes of industry, while at the same time the organization is extremely touchy regarding any criticism of its own operations.

No doubt it is this sort of advice which accounts for occasional letters received by ELECTRIC REFRIGERATION NEWS from suspicious housewives who want to know, by return mail, the inside facts about various brands of refrigerators and the companies which make them. (See example in "Letters" column of this issue.)

About the best we can do is to refer them to our 692-page DIRECTORY, in which we have condensed quite a little information, and which is available for the small price of \$3.00. This book, however, was not designed for the household. It is intended for the industry.

We truly wish that Consumers Research, or somebody, would take on the job of giving the public plain, sensible, and practical information which would be helpful to a housewife. Now that over 5 million homes have taken the risk of trying electric refrigeration, it would seem that there is no reason why anyone should incur nervous prostration over the simple act of walking into the store of any well-known local merchant and buying a refrigerator made by any of the nationally known manufacturers whose names and products are known throughout the entire country and all over the world.

LETTERS

Refrigeration Selling Practices in Michigan

Home Appliance Co.
12th St. and West Grand Boulevard
Detroit, Mich.

June 29, 1934.

Editor:

Now that the refrigeration business has dropped into an almost stagnant condition, it would be a good time to do just a little thinking along the lines of ethical selling such as the NRA suggests.

I have before me a number of letters, answers to notes I sent to different sections, and this, aided by your articles as regards "Fair practices" tells a rather putrid story of the state of affairs in Michigan.

It is amazing to me that the factories in and around Michigan and a few outside will stand idly by, with big NRA signs in their windows, telling the public, "we do our part" and let retail sales of electric refrigeration drop to the lowest state of ethical selling in their history.

I wonder if they realize that the smaller dealers, who are responsible for probably 60 per cent of the deals, especially in the outside territory and smaller towns, are in far worse condition than they were in 1932, due to the practices allowed by the factories and being followed by a small percentage of the larger houses.

Don't they realize that it is necessary for the small dealer to sell at 6 per cent and absorb the difference.

Are they overlooking the fact that "no down payment" is only available to the houses that carry accounts, making it necessary for the little fellow to "overlook" the down payment, or lose the business.

Is it not true that salesmen are entitled to a fair commission, at least, even though the factory is well aware of the fact that the refrigerator industry is the only business where skilled salesmen are employed on a strictly commission basis.

Well, how in the name of Pete can the small dealer pay a fair commission when he has to absorb the differentials mentioned above.

I am acquainted with a couple of sales made in which an out-of-town buyer came to Detroit to take advantage of the "war" and the "smart" salesman delivered the boxes within the required limits.

It is silly to think that the present practices in retail selling have come to stay, it has been tried before with fatal results to even the big fellow, and it is just as silly for the factories or their representatives to allow it to continue and hang an "NRA" sign in their retail store windows, that's hypocrisy, because the retail store is not following fair retail practices.

Cannot your paper help in this matter? With your help maybe we can adopt a policy like the western dealers and save the small dealer, otherwise he will perish and the factory will be put to the expense of reorganizing every small town in the country where this condition exists.

I have talked with many of the younger generation who have bought on the NO DOWN PAYMENT plan and have found they actually do not intend to keep their merchandise. "We will keep it till the price of ice drops," one couple told me.

Such cases as those prove the loose methods that no down payment suggests, and it is no credit or benefit for the factories to allow it, and hang an NRA sign in their retail stores.

PAT QUINLAN,
Salesmanager.

G-E Dealer Sales In Georgia

General Electric Company
Nela Park, Cleveland, O.

June 19, 1934.

Editor:

General Electric dealers are certainly blessed by having one such as you, so talented and suave. I have never doubted your editorial wisdom. But now I know how unusual your talent is when it strikes so close to home.

General Electric dealers will thank you and so does General Electric. However, before both you and I become embarrassed over one statement which I made regarding the Georgia Power sales versus dealer sales in the state of Georgia, let me say I'm sorry to have misled you.

The last paragraph in the column should have read that in the state of Georgia, although the Georgia Power Company is doing an outstanding job on General Electrics, the dealers sell more than 33 per cent of the total General Electrics sold in the "state of Georgia."

A. A. UHALT,
Manager, Dealer Division.
P.S. Flash! National sales on General Electrics show dealers selling 35 per cent of entire G-E total through May, 1934, exclusive of dealers in the "metropolitan" cities or distributors' retail areas.

An Unsolicited Recommendation

International General Electric Co.
Incorporated
79, Avenue Des Champs-Elysees
Paris (VIIIe.)

June 19, 1934.

Editor:

We beg to enclose herewith copy of our letter of even date to Mr. P. A. Georgiadis, Athens, which you will find is self-explanatory.

H. A. GRANARY,
Refrigeration Dept.

Mr. A. P. Georgiadis
Menelau, 76,
Callithea, Athens, Greece.

Your letter to the *Electric Kitchen Times*, Cleveland, Ohio, was sent to our company in New York, who, in turn, have referred it to us, as you have been advised by the editor of *Kitchen Times*.

From the first paragraph of your letter, in which you say that you desire to keep posted on the present condition of the electric refrigerator and range industries, their changes and improvements, as well as advertising, I believe that a weekly journal called *ELECTRIC REFRIGERATION NEWS*, published in Detroit, Michigan, by the Business News Publishing Co., 5229 Cass Avenue, Detroit, Michigan, will give you exactly the information which you desire. The subscription price to this journal is \$3.00, in America and the Postal Union Countries; in other countries it is \$5.00 a year.

The LaSalle Training Course, to which the editor of *Electric Kitchen Times* refers, is simply a general training course for salesmen and will not give you the latest developments, propaganda material, etc., in which you seem to be interested.

We are mailing you under separate cover a recent issue of *ELECTRIC REFRIGERATION NEWS*, so that you may see what it is like.

H. A. GRANARY,
Refrigeration Dept.

Back to First Principles

Potter Refrigerator Corp.
220 Delaware Ave., Buffalo

June 25, 1934.

Editor:

Right in line with the point brought out in your editorial of June 20, page 8, regarding sales organizations' going back to first principles, the Potter organization has been using a particularly effective form of small group, dealer meetings which, we believe, as far as our own company is concerned will entirely take the place of the larger gatherings or dealer conventions.

This splendid point that you brought out regarding the importance of getting back to specialty selling is thoroughly in line with the purpose of our group meetings.

The dealers themselves through a closer and more personal interchange of ideas are deriving so much more benefit that we are being urged by many of our dealers to make these small group meetings a regular and established Potter tradition, using such meetings entirely in the place of the larger dealer convention type.

While it takes a lot longer on this basis to make all the rounds, yet the enthusiasm of our dealers is so great over such meetings that we believe this idea has already built itself a permanent position in our company.

IRVING R. HALSEY,
Assistant to the president.

Prospect Seeks Guidance

Little River, Kan.

June 27, 1934.

Dear Sir:

Expecting to purchase a refrigerating unit soon am anxious to learn all I can of their construction and advantages. I have had explained to me the insulation employed by the Frigidaire. Do the other units use the same? I am particularly interested in the Leonard. Give me your honest opinion based upon real knowledge, as it is, of its comparison with Frigidaire, please. Second—the Kelvinator, then General Electric. If you were purchasing for your personal use, which would you choose, considering engine power, insulation, and equipment?

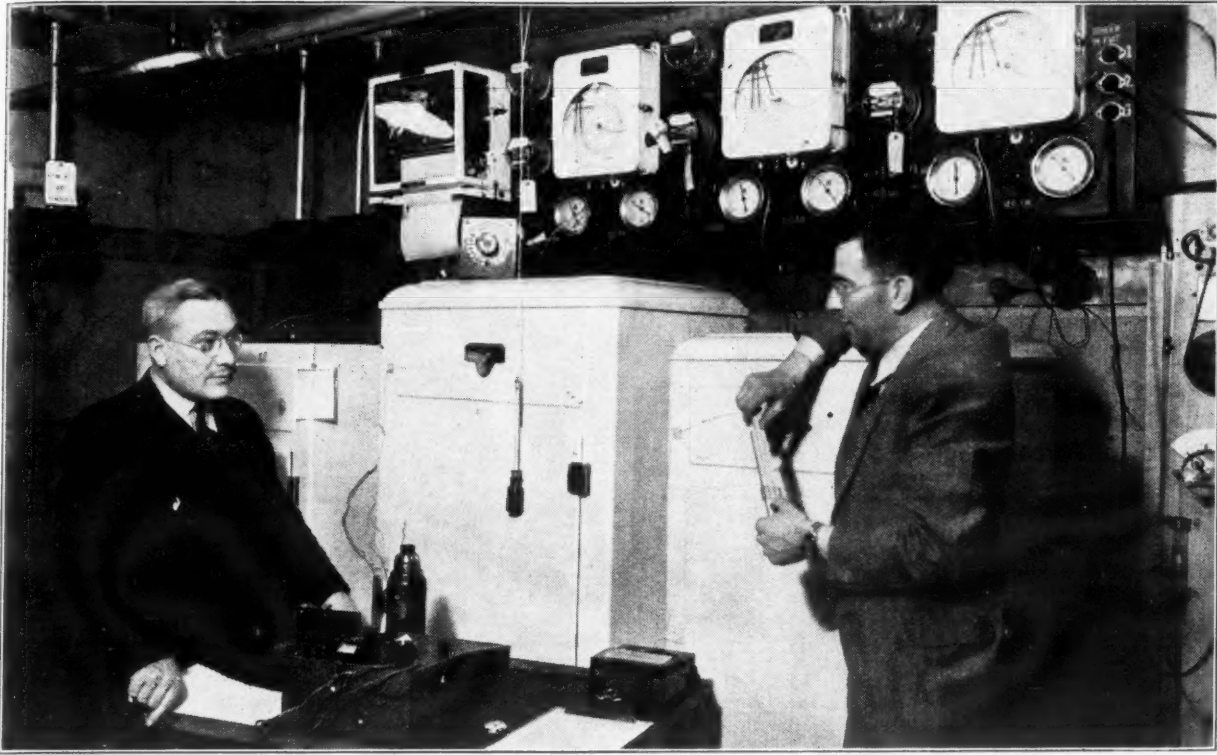
EDNA PERCY.

Answer: We thank you, lady, for the compliment implied by your request. While your questions may sound simple and fair enough, the answers are not so easy. Furthermore, we fear that it will be difficult to explain briefly and clearly just why we cannot give you a satisfactory answer.

If perchance we had received four letters identical with the above, from the same community, our task would be a cinch. Then we could have advised one to buy a Leonard, the second a Frigidaire, the third a Kelvinator, and the fourth a General Electric.

Thus, we could have (1) preserved our reputation for an unbiased attitude toward four competitive manufacturers, (2) helped four dealers (all subscribers, we hope) make a sale apiece (3) made four homes happy with good reliable electric refrigerators and (4) had the pleasure of relieving simultaneously the mental distress of four trusting women.

Westinghouse Units on Test for an Army Engineer



F. A. Harshbarger (right), Westinghouse refrigeration engineer, interprets the results recorded by the delicate testing apparatus for J. R. Gramm, senior engineer, construction division, U. S. War Department. The Army recently placed an order for Westinghouse refrigerators.

New York Distributors Draft Rules On Apartment House Sales

(Concluded from Page 1, Column 3)

Hayes; its own; Filtered Water Service, Inc., its own; Frigidaire Sales Corp., its own; Great Bear Spring Co., G-E, Cordley & Hayes, Frigidaire, Universal; Charles E. Hires Co., Frigidaire and its own; Kelvinator Sales Corp., its own; Pine Hill Crystal Spring Water Co., its own; Puro Filter Corp. of America, its own; and Rex Cole, Inc., General Electric.

Since the association was formed three years ago, much of the effort of its manager and members has been directed toward eliminating the hazards of selling refrigerators to apartment houses, and collecting for them.

As explained by Mr. Callahan, the following regulations are incorporated in any apartment house deal made by one of the association's 19 distributors:

Sales Contract

When refrigerators are sold to an apartment house, the owner of record signs the sale contract, and the mortgagee—a bank, for example—must sign a rider which is a part of the contract and which is filed as a conditional sales contract in the registrar's office. The rider specifies that payments on the refrigeration shall be met by the mortgagee during the time he has a rent assignment on the building.

Upon termination of the rent assignment, the owner continues payment on the refrigerators—it behooves him to do this because of his equity in the merchandise.

Should the mortgagee foreclose, and take the building over in his own name or in that of anyone acting in his behalf, he is still obligated to continue payment on refrigerators installed in the apartments as long as he holds title to the structure.

When the building is sold, the new owner assumes the responsibility for meeting remaining payments. The mortgagee is obligated, however, to pay enough on the refrigerators before the building is sold—to cover at least the first third of the price of the units.

With conditions as they are today, however, the mortgagee is almost certain to pay considerably more than one-third of the cost of the refrigerators. Apartment house buyers are few, so even if a foreclosure procedure is underway, it drags along until the refrigerator distributor has collected from the mortgagee a good portion of the amount owed him before the building goes to the new owner.

10 or 15 Per Cent Down

The required down payment on electric refrigerators for apartment house installation is 10 per cent in most cases. For mortgage and title companies now in rehabilitation by the state, the required down payment is 15 per cent on units purchased for buildings to which they hold title.

When a rent assignment has been made, and the owner refuses to sign a refrigeration sales contract containing some of the above outlined terms, the title company is considered the purchaser of refrigerators put in the building, and assumes complete responsibility for payment.

There is a provision in the contract for a deal of this kind, however, stating that in the event the building is sold or the rent assignment terminated, the title company will produce an assumption agreement on the part of the new owner or the owner

to whom the building reverts. The owner's credit must be satisfactory to the distributor.

When a mortgage company owns an apartment building and buys refrigerators for it, it is not in any event released from making complete payment for them except by mutual consent of all parties concerned.

No member of the association will rent refrigerators to an apartment building, and neither will it assign more than four refrigerators for test or trial purposes. Maximum payment period on units in apartments is 36 months.

Only Seven Violations

In the three years of the association's existence, there have been only seven violations of these terms of sale by distributor members, according to Director Callahan. No two have been made by any one company, and no two violations have been the same.

Distributors have been able to get mortgage and title companies to comply with these regulations because leading finance companies have cooperated in demanding these terms.

Some work has been done by the association in standardizing sales practices in the commercial machine field. Its members now require a minimum down payment of 20 per cent, and give a maximum of 24 months to pay.

A good part of the distributors now demand cash for all work involved in installing a commercial machine other than the actual placing and starting of the unit—insulating or repairing cooling rooms, etc.

The association has an interchange of credit information among its members. Any of the latter violating any association ruling is required to appear before the board of governors to make explanations.

Members of the organization are:

Allen-Ingraham, Inc., Westinghouse; Brooklyn Union Gas Co. and Consolidated Gas Co., Electrolux; Bushwick-McPhilben Corp., Spanton; Frigidaire Sales Corp., Frigidaire; Sam S. Glauber, Inc., Mayflower; Graybar Electric Co., Ilgkold; General Household Utilities Co., Inc., Grunow; Kelvinator Sales Corp., Kelvinator; Majestic New York, Inc., Majestic; Montgomery Ward & Co., Ward's; Norge Corp., Norge; North American Radio Corp., Grunow; Rex Cole, Inc., General Electric; Servel Sales, Inc., Servel; E. A. Wildermuth, Kelvinator; Wholesale Radio Equipment Co., Stewart-Warner; Crosley Distributing Co., Crosley; E. B. Latham & Co., Leonard.

C. I. T. Acquires Midland Acceptance Corp.

NEW YORK CITY—Commercial Investment Trust Corp. announced last week the acquisition of Midland Acceptance Corp. with headquarters in Cincinnati.

The stock of Midland Acceptance Corp. is being purchased outright, and the business of the company will be transferred to the operating subsidiaries of C.I.T., under whose name the future business will be conducted.

Midland Acceptance Corp. has specialized largely in the financing of the motor business, and reported a 1933 gross volume of business of \$7,869,338. The company has been active in financing sales of all makes of motor vehicles and has approximately 200 active dealer accounts.

New York May Issue Licenses to Dealers

(Concluded from Page 1, Column 1)

making their own standards, if New York does so, with a resultant hardship on manufacturers.

The Electrical Association in its draft of a proposed ordinance makes some attempt to limit the scope of electrical apparatus subject to civic approval, and Nema places even greater emphasis on this point, recommending that heavy equipment not be affected by the act.

Both associations are recommending that the ordinance apply strictly to retail operations, but neither has made any attempt to quash the actual licensing proposal, or to change the proposed fee—\$15 for the initial payment, and \$10 per year thereafter.

On June 28, however, 30 New York City retailers—including department stores, chain variety stores, and small electrical and hardware dealers—protested the licensing in a hearing before Commissioner Davidson in the Municipal building. The city's vagueness on standards for judging electrical equipment was attacked, also.

Milton Winn, attorney for S. H. Macy & Co., Inc., said that while his organization agrees with the principle of increasing safety through proper regulation of standards, it feels that the proposed ordinance is lacking in that it fails to set up standards. He charged also that it places too much responsibility on one person (the commissioner).

H. Nelson Street, vice president of the Retail Dry Goods Association of New York, said that merchants are troubled with too many regulations already, and declared that no facts have been presented showing need for such an ordinance.

It is estimated that there are approximately 10,000 dealers in New York City who will be affected if the ordinance is passed—making a total

annual payment of \$100,000 for licenses to operate.

At the present time, according to Arthur L. Abbott of the Uniform Legislation department of National Electrical Manufacturers Association, 57 cities in the United States prohibit the sale of unapproved electrical material.

Thirty-five of them recognize standards of the Underwriters' Laboratories, eight of them refer to standards of the U. S. Bureau of Standards, four mention the National Electrical Code, and the remainder make no mention of standards in their ordinances. In only nine of these cities are dealers' licenses required.

The cities prohibiting sale of unapproved merchandise are:

Little Rock, Ark.; Alhambra, Bakersfield, Brawley, Burbank, Coronado, Glendale, Inglewood, Lompoc, Long Beach, Los Angeles, Modesto, Monterey Park, Orange, Oxnard, Pomona, Sacramento, San Bernardino, San Buenaventura, San Diego, San Fernando, San Francisco, Santa Ana, Santa Barbara, Santa Maria, South Gate—all in California; Colorado Springs; Hartford; Jacksonville, Fla.; Atlanta and Savannah, Ga.; Twin Falls, Idaho; Hammond and South Bend, Ind.; Waterloo, Iowa; Coffeyville and Topeka, Kan.; New Orleans and Shreveport, La.; Flint, Mich.; Reno, Nev.; Enid, Okla.; Eugene, Portland, and Salem, Ore.; Memphis, Tenn.; Richmond, Va.; Tacoma, Wenatchee, and Yakima, Wash.; Kenosha, Madison, Milwaukee, Oshkosh, Watertown, Wauwatosa, and West Allis, Wis.

Refrigeration members of the Electrical Association of New York, according to Ralph Neumuller, managing director, are: Westinghouse Electric & Mfg. Co.; Allen-Ingraham, Westinghouse distributor; General Electric Co.; Frigidaire Corp.; Norge Corp.; Leonard Refrigerator Co.; E. B. Latham & Co., Leonard distributor; E. W. Wildermuth, Kelvinator distributor; Apex-Rotarex Co.; Graybar Electric Co.

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MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION EQUIPMENT

New York Board Liberalizes Oil Burner Rules

Adopted by the Board of Standards and Appeals June 15, 1934

(Superseding Fuel Oil Rules adopted by the Board of Standards and Appeals Nov. 6, 1919; amended Jan. 6, 1922; Jan. 18, 1924; Oct. 19, 1926; Sept. 11, 1928; Jan. 11, 1929; March 20, 1931; May 12, 1931; Nov. 24, 1931; May 10, 1932; June 24, 1932; and Nov. 4, 1932.)

Authority: Section 718 A of the Charter of the City of New York to carry into effect the provisions of Chapter X, Code of Ordinances.

Rule 1—Scope

(a) No person shall install oil-burning or oil-storage equipment for use within the City of New York except as provided in these rules.

(b) These rules shall not apply to gas companies storing or using oil in the manufacture of illuminating gas for public use.

Rule 2—Definitions

For the purpose of these rules, the following terms shall be interpreted in accordance with these definitions:

Approved: Shall mean devices hereafter approved by the Board of Standards and Appeals and also, when required by the Board of Standards and Appeals, approved, listed as standard, and/or labeled by any nationally recognized standard testing laboratory not operated for commercial profit, provided all such devices are installed in accordance with these rules. Such approval is subject to suspension or revocation for non-compliance with these rules. All devices approved by the Board of Standards and Appeals prior to the adoption of these rules shall be accepted.

Automatic Pump: Shall mean an automatic transfer pump operating independent of the burner to provide a continuous supply of oil.

Burner: A device designed for the purpose of burning oil.

Discharge Line: That portion of the line between the discharge outlet of the pump and the burner oil inlet connection.

Dwellings: Buildings used exclusively for dwelling purposes and occupied by one or two families, including convents, rectories, and monasteries.

Electrically Grounded: For protection against lightning shall mean storage tanks set directly in or on the ground and/or with underground piping connections. Where storage tanks without underground piping connections are built on bases above the surface of the earth, such storage tanks shall be grounded at two (2) points, 180° (degrees) apart as follows:

(1) The conductor from tank to ground connection shall be of copper not smaller than No. 6 (.162") A.W.G. wire, or pipe not less than one-half inch (1/2") in diameter.

(2) One end of conductor shall be permanently and electrically bonded to tank. The other end shall be bonded to a ground connection consisting of a water pipe or a rod, pipe or plate having a surface area of not less than one hundred and ninety (190) square inches, buried in moist earth not less than two feet (2') below the surface of the earth.

Fill Pipe: That portion of the line between the fill pipe terminal and the fill pipe connection in the storage tank.

Fire Retarding Materials: (a) One-half (1/2) inch plaster boards, or asbestos boards, or three-eighths (3/8) inch gypsum wall boards weighing not less than 16 pounds per square yard with pointed joints covered with No. 26 U. S. gauge sheet metal with one (1) inch

lapped seams nailed to the wood beams when spaced not more than sixteen (16) inches on centers, or nailed to furring strips when the floor beams are spaced more than sixteen (16) inches on centers, or

(b) Two thicknesses of one-quarter (1/4) inch asbestos boards laid with tight staggered joints and nailed to the beams, when spaced not more than sixteen (16) inches on centers, or nailed to furring strips when the floor beams are more than sixteen (16) inches on centers, or

(c) Metal lath weighing not less than three pounds per square yard, attached to furring strips and plastered with Portland cement mortar at least three-quarters (3/4) inch thick.

Note:—All fire retarding material to be applied as required in rules for fire retarding material of the Board of Standards and Appeals.

Oil: Any liquid mixtures, substance or compound derived from petroleum, including kerosene and fuel oil as defined in the Code of Ordinances, Chapter X, Article 1, Section 1.

Oil Burning Equipment: Any device including burners, oil burning heaters, internal combustion engines used for heating, power or other purposes designed for and/or using oil as defined in these rules.

Oil Level Indicating Device: A means by which the level of the oil in a storage tank may be indicated.

Overflow Pipe: A pipe which conveys, by gravity, the oil from the maximum level of an auxiliary tank to the storage tank or from the pump to the storage tank.

Permanent Deformation: Whenever phrase, "without permanent deformation," is used in these rules it shall mean that the tanks or containers shall, after release of test pressure, resume their original size and shape.

Permit: Shall mean permit for storage of oil.

Portland Cement Concrete: Shall mean a mixture of one (1) part cement and not more than two and one-half (2 1/2) parts sand and five (5) parts of coarse aggregate and complying in all other respects with the requirements of the Code of Ordinances, Chapter V, Article 2, Section 28.

Preheater: A device designed for heating oil for the purpose of decreasing the viscosity.

Relief Valve: A valve held shut by a spring or other means to automatically relieve pressure in excess of its setting.

Relief Line: That portion of the line between the bypass connection of the relief valve and the supply line of storage tank.

Remote Control: A hand, electric, or mechanically operated device to shut off the oil supply. A thermostat is not acceptable as a remote control.

Scavenging Line: A line installed to permit the removal of water or foreign matter from a storage tank.

Shop Fabricated: Shall mean completely built in the shop of the tank manufacturer.

Shut-Off Valve: A device that can be actuated to prevent the flow of liquid in a line of pipe.

Storage Container: Any container for oil connected to a burner or oil-burning heater and having a capacity of ten (10) gallons or less.

Storage Tank: Any container for oil having a capacity of two hundred and seventy-five (275) gallons or more, having a fill line and vent line connected thereto.

Storage Tank, Auxiliary: Any tank for oil having a capacity of not over 60 gallons and used as an intermediary tank for gravity feed and equipped with an automatic or manually operated pump.

Supply Line: That portion of the line between the storage tank and the pump

oil inlet connection. Where a pump is not used, it shall be that portion of the line between storage tank and burner and burner oil inlet connection.

Test Well: An opening in the top of the storage tank or a straight pipe connected to such opening through which a gauge stick may be inserted into the storage tank.

Transfer Pump: An oil pump that is not an integral part of the burner and which is installed between storage tank and burner.

Vent Pipe: That portion of the line between vent pipe terminal and vent pipe connection in the storage tank.

Rule 3—Oil Permitted

(a) Oil permitted under these rules shall be any liquid mixture, substance, or compound derived from petroleum, shale oil, coal tar, and the liquid products thereof, and shall have a flash point not lower than 100 degrees Fahrenheit when tested in a Pensky-Martens closed cup tester. (American Society for Testing Materials Method D98-22.)

(b) The use of crankcase refuse oil as fuel oil is strictly prohibited unless complying with flash point requirement in paragraph (a) above and is used with burners designed to burn No. 5 U. S. commercial standard grade oil.

Rule 4—Burners

(a) Burners, including oil-burning heaters, shall be as approved, provided with suitable safeguards to prevent abnormal discharge of oil.

(b) Approval of burners or oil-burning heaters designed for installation with storage of not more than six (6) gallons shall include approval of storage containers and limitations of installation. If more than six (6) gallons' storage is desired for such burners or oil-burning heaters, a storage tank shall be installed as provided for in these rules. Portable containers of not more than six (6) gallons' capacity may be filled from such storage tanks by means of an approved hand pump located above the top of the tank.

(c) The requirements of these rules shall not apply to the use and installation of portable burners not requiring a connection to a flue where such burners are of the type commonly used for household purposes including oil stoves, oil heaters, and oil lamps equipped with a woven wick or mechanical device the movement of which is essential to flame adjustment; nor do the requirements of these rules apply to such portable apparatus such as blow torches, soldering pots, tar heaters, snow melters, etc.

Rule 5—Material and Construction of Tanks

Section 1. All Tanks Except Vertical Above-Ground Storage Tanks

(a) All storage tanks for oil of two hundred and seventy-five (275) gallons' capacity or more shall be built of new full weight American open hearth tank steel, free from physical imperfection. They shall be welded; or riveted and welded; or riveted and caulked. Filler of any kind between plates is prohibited. The minimum thickness of shell and head plates shall be U. S. Standard 12 gauge (.109"). Auxiliary storage tanks of 60 gallons or less shall be similarly constructed but need not be of a gauge thicker than U. S. Standard No. 14.

(b) At time of installation all storage tanks shall bear a permanently fixed plate, spot-welded or equivalent, bearing the name of tank manufacturer, the gauge of material and capacity of tank. All shop fabricated storage tanks shall be installed without structural alteration.

(c) All openings shall be through the top of the storage tank except that 275-gallon storage tanks may be provided with a three-quarter inch (3/4") opening for gravity discharge and a one-inch (1") opening in the bottom for cleaning and protection against corrosion.

(d) All 275-gallon storage tanks shall have permanently affixed the approval label of a nationally recognized standard testing laboratory not operated for commercial profit. They shall be designed for a maximum steel fibre stress of not more than 18,000 pounds per square inch and capable of withstanding hydrostatic test of 10 pounds per square inch without permanent deformation, rupture, or leakage.

(e) All storage tanks of more than two hundred and seventy-five (275) gallons' capacity shall be designed for a maximum steel fibre stress of not more than 18,000 pounds per square inch and capable of withstanding a hydrostatic test without permanent deformation, rupture, or leakage as follows:

(1) Oval, obround, rectangular, or specially shaped storage tanks, twenty pounds per square inch;

(2) Cylindrical storage tanks, fifty pounds per square inch.

(f) All cylindrical storage tanks shall have dished heads with a curvature the radius of which is not greater than the diameter of the tank. Dished heads shall be formed with an adequate cylindrical extension rim to provide welding or riveting surface.

(g) All buried storage tanks shall be thoroughly coated on the outside with hot tar, asphaltum, or other equivalent rust-resisting material, and where the tank is 48" or less in diameter the shell shall have a thickness of not less than 3/16 of an inch and where the tank is over 48" in diameter the shell shall have a thickness of not less than 1/4 of an inch.

(h) Manholes; where used for oils having a viscosity less than 500 sec. Saybolt Universal at 100° F. shall have manhole covers permanently sealed; where used for oils having a viscosity greater than 500 sec. Saybolt Universal at 100° F. (No. 5 or No. 6 Commercial Standard grades) shall have manhole covers bolted or otherwise secured to the tanks and kept hydrostatically tight at all times.

Section 2. Vertical Above-Ground Storage Tanks

(a) All vertical above-ground storage tanks shall be built of new full weight American open hearth tank steel, free from physical imperfection. They shall be welded; or riveted and welded; or riveted and caulked. Filler of any kind

Dealers Hail New Rules As Boon to Business

NEW YORK CITY—Oil burner dealers here will soon swing into their heavy selling season with high hopes of doing a record-breaking volume of business, their expectations being based upon the fact that the city's Board of Standards and Appeals has just liberalized its rules governing the installation and use of oil-burning equipment and the storage of oils.

So extensive is the board's modification of its former regulations that Harry F. Tapp, executive secretary of the American Oil Burner Association, last week ventured the opinion that oil burner installation costs will be reduced from \$40 to \$100.

The new rules were adopted on June 15, and will become effective 20 days after publication, which was on June 19. They pertain, of course, only to the city of New York. It was learned July 2, however, that the new rules may undergo some amendment in the near future.

Highspots of the code are that it now makes provision for use of range oil burners and similar equipment, permits use of 275-gallon basement tanks in any building—whereas they were confined to residences before—and is more flexible in its regulation of insulation of tanks of more than 275 gallons capacity.

Also, the rules now provide for use of anti-siphon devices, making it no longer necessary to bury tanks so low under the burners. Ceiling protection is no longer required, except where the top of a non-insulated boiler is 24 in. or less from the ceiling, or where an insulated boiler is 12 in. or less from it.

between plates is prohibited. The minimum thickness of shell and bottom plates shall be one-quarter inch (1/4") and the minimum thickness of roof plates shall be one-eighth inch (1/8") and in no case shall the construction of the tank be less than the standard requirements of American Petroleum Institute specifications.

(b) The roofs of vertical storage tanks shall be designed to shed water and shall be permanently grounded to the tank shell. This, however, shall not exclude the use of floating steel decks.

(c) All above-ground storage tanks shall be electrically grounded.

(d) Vertical above-ground storage tanks shall be without permanent deformation and shall show no leaks when completely filled with water for test purpose prior to filling with oil.

Section 3. Storage Containers

(a) Storage containers for oil of six (6) gallons capacity or less used in connection with burners or oil-burning heaters shall be designed to withstand a hydrostatic pressure test of five (5) pounds per square inch without permanent deformation, rupture or leakage and shall be approved as provided in Rule 4(b). Glass storage containers shall not exceed three gallons capacity, protected with a metal jacket provided with hand grips and designed to be rigidly fastened to stand or wall and shall be approved as provided in Rule 4(b).

Rule 6—Location of Tanks

Section 1. Inside of Buildings

(a) Storage tanks having a capacity of two hundred and seventy-five (275) gallons and auxiliary tanks may be installed above ground in or on the lowest story of a building, provided such tanks shall be mounted on substantial incombustible supports, with tank permanently attached thereto, and located not less than seven feet (7'), measured horizontally from any furnace or source of exposed flame unless tank is protected as provided for in Rule 6, Section 1(b). Such storage tanks inside buildings shall be not less than two hundred and seventy-five (275) gallons' capacity and not more than one such tank shall be connected to one burner. Not more than two (2) two-hundred-and-seventy-five (275) gallons storage tanks shall be installed in a building above ground without protection as provided for in Rule 6, Section 1(b).

(b) Storage tanks having a capacity of more than two hundred and seventy-five (275) gallons, when installed inside of buildings, shall be located in or on the lowest floor level and all portions of such tanks above the floor shall be protected by a continuous jacket of not less than four inches (4") of Portland cement concrete reinforced with not less than No. 20 steel wire gauge wire cloth 2" x 2" mesh, and extending at least four inches (4") beyond the horizontal outline of tank in all directions.

Each storage tank may be placed in an enclosure having masonry walls not less than eight inches (8") in thickness and of dimensions six inches (6") greater on all sides than the outside dimensions of the storage tank. The walls of the enclosure shall be carried up to a height not less than one foot (1') above the top of the tank and the space between the tank and the walls of the enclosure shall be completely filled with clean sand or well tamped earth.

(c) The capacity of individual storage tanks located inside of buildings shall not exceed twenty thousand (20,000) gallons.

Section 2. Outside of Buildings, Below Ground

(a) Storage tanks located outside of buildings, below ground, shall be buried with the top of the tank not less than two feet (2') below the surface of the ground. Tanks shall be placed on firm soil and shall be surrounded by clean sand or other tamped earth, free from ashes or other corrosive substance, and free from stones larger than will pass through a one-inch (1") mesh, when necessary to prevent floating, tanks shall be securely anchored.

(b) Along the line of subways no tank shall be placed within twenty (20) feet of any wall separating a building from the subway, and, if practicable, tanks shall be placed in a lower position than the roadbed of the subway, except as may be modified in specific instances by the Board of Standards and Appeals.

Section 3. Outside of Buildings, Above Ground

(a) Storage tanks located outside of buildings above ground shall be not less than one and one-quarter (1 1/4) tank diameters and in no case less than ten feet (10') from the line of adjoining property, the nearest building or adjacent tank. Such tanks shall be electrically grounded. The maximum capacity of individual tanks located outside of buildings above ground shall be fixed by the following schedule:

	Gallons
If distant 25 feet from line of adjoining property which may be built upon	16,000
If distant 30 feet	24,000
If distant 40 feet	36,000
If distant 50 feet	48,000
If distant 60 feet	60,000
If distant 75 feet	96,000
If distant 85 feet, or over	100,000

(b) Each such storage tank shall be protected by an embankment or a dyke. Such protection shall have a capacity of not less than one and one-half (1 1/2) times the capacity of the tank so surrounded and shall be at least four feet (4') high but in no case higher than one-fourth (1/4) the height of the tank when the height of the tank exceeds sixteen feet (16'). Embankments or dykes shall be made of earthwork with clay core; of masonry, or of impervious reinforced concrete. Earthwork embankments shall be firmly and compactly built of good earth, free from stones, vegetable matter, etc., and shall have a flat section at the top of not less than three feet (3') and a slope of at least one and one-half (1 1/2) to two (2) on all sides. Concrete or masonry dykes shall be so designed as to safely carry the entire volume of the oil in the tank so surrounded. Embankments or dykes shall be continuous and unpierced. See Chapter 10, Section 111, Code of Ordinances, for required fire extinguishing system.

Rule 7—Piping

Section 1. Installation of Piping

(a) Piping shall be run in a substantial and workmanlike manner. Exposed piping shall be protected against mechanical injury and shall be securely supported with rigid metal fasteners or hangers. All pipes connected to buried tanks except test well piping shall be provided with double swing joints at tank.

(b) Only new standard full-weight iron, steel or brass pipe, or new extra-heavy copper or brass tubing, may be used. Flexible metal tubing, when used for conveying oil shall be adequately protected. Soldered connections are prohibited.

(c) Overflow pipes where installed shall not be smaller in size than the supply pipe.

Section 2. Relief Valves

(a) Where a shut-off valve is installed in the discharge line from an oil pump a relief valve shall be installed in the discharge line between the pump and the first shut-off valve.

(b) Oil preheaters shall be provided with a relief valve to prevent excessive oil pressure.

(c) Relief valves shall be set to discharge at not more than one and one-half (1 1/2) times the maximum working pressure of the system. The discharge from relief valves shall be returned to storage tank or to the supply line. There shall be no shut-off valves in the line of relief.

Section 3. Vent Pipe

(a) An open vent pipe of iron or steel, without trap, and draining to the tank, shall be provided for each storage tank. The lower end of the vent pipe shall not extend through the top of the storage tank more than one inch (1"). Cross connection between vent pipe and fill pipe is prohibited.

(b) Where a battery of storage tanks, designed to hold the same grade of oil, is installed, vent pipes may be run into a main header.

(c) Vents shall be not less than one and one-quarter inches (1 1/4") in diameter for storage tanks up to 1,100 gallons' capacity and not less than two inches (2") in diameter for storage tanks of 1,100 gallons and more. Vents for auxiliary storage tanks shall not be less than 1/2 inch in diameter and may be run into the storage tank vent.

(d) Vent pipes shall be provided with weatherproof hoods and shall terminate outside the building not less than two (2') feet from any building opening and not less than five feet (5') nor more than twelve feet (12') above the fill pipe terminal. If the vent pipe terminal is not visible from the fill pipe terminal location, a one-inch (1") line shall be continued.

(Continued on Page 11, Column 1)

REPUTATION



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New York Revises Oil Burner Rules

(Continued from Page 10, Column 5)

ected to tank and shall parallel the fill pipe and terminate at the fill pipe terminal with unthreaded end. Such line shall be provided with a check valve set to prevent flow of surface water to storage tank.

Section 4. Fill Pipes

(a) Fill pipe shall terminate outside the buildings with the fill pipe terminal located at or above grade at least five feet (5') from any building opening or subway grating at or below the level of the fill pipe terminal. Such fill pipe terminal shall be not more than twenty feet (20') from the curb or private right of way.

(b) Each storage tank shall be provided with a separate fill pipe except where a battery of tanks is installed, containing the same grade of oil, a common fill and header pipe may be installed provided the area of each branch fill pipe and header pipe is equal to the area of the fill pipe. Each branch fill pipe shall be provided with a shut-off valve.

(c) Where the top of the storage tank is above the fill pipe terminal the fill pipe shall be connected to the top of the tank and be provided with a shut-off valve and a swing check valve which shall be located at the fill pipe terminal.

(d) All fill pipe terminals shall be designed to prevent tampering by unauthorized persons and shall be provided with raised letters reading: "Fuel Oil" on fixed portion of terminal body. Where there is a storage system volatile inflammable oil and a storage system for fuel oil to be used in the same premises, the terminal of fuel oil fill pipe shall be provided with a left-hand thread, and the fill pipe fitting shall be of a different size than that required for the fill pipes to gasoline tanks.

(e) Fill pipes shall be designed to prevent escape of oil vapor from storage tanks at fill pipe terminal.

Section 5. Heating Coils in Storage Tanks
All heating to reduce viscosity of oils in storage tanks shall be only by means of hot water or low pressure (ten (10) pounds per square inch maximum) steam coils.

Section 6. Scavenging Line

When a scavenging line is installed it shall terminate outside of the building and shall be capped oil tight when not in use.

No. 8—Valves and Control Of Oil Flow

(a) Each supply line from storage tanks of two hundred and seventy-five (275) gallons' capacity and from auxiliary storage tanks shall be provided with a shut-off valve at the burner and when connected to burners designed for gravity feed, shall be provided with an approved constant level device.

(b) Each supply line for storage tanks of more than two hundred and seventy-five (275) gallons' capacity, shall be provided with a shut off valve at the burner and where the top of the tank is above the oil inlet connection to the burner and/or transfer pump, shall be provided with an approved anti-siphon device located at the highest point in supply line, except that where heavy oil (No. 6 Commercial Standard Grade) having a viscosity of one hundred (100) seconds or more Saybolt Furol at one hundred and twenty-two degrees Fahrenheit (122° F.) is used the anti-siphon device shall not be required.

(c) Except as may be modified in specific instances by the Board of Standards and Appeals, oil from storage tanks of two hundred and seventy-five (275) gallons' capacity or more may be delivered to burners installed above the lowest floor of a business building only under the following provisions:

1. Plans for such installation shall be submitted for approval to the administrative official having jurisdiction before such installation is made.

2. Such burners shall not be installed in any story of any building the floor of which is more than fifty feet (50') above the street level. Only one oil delivery line shall be installed for each floor.

3. Oil delivery lines to burners located above the lowest floor of a building shall not be larger than two inches (2") iron pipe size.

4. The pressure in oil lines to burners located above the lowest floor of a building shall not be more than is necessary to deliver oil to the burners and such pressure shall not in any case exceed thirty (30) pounds per square inch.

(d) A remote control shall be provided whereby the flow of oil to any burner can be stopped, and such remote control shall be located outside the entrance to the room in which the burner is located, and as close to such entrance as practical, except when outside location is impractical such control may be located immediately inside the room in which the burner is located if such location is accessible at all times. All such controls shall be legibly labeled "Remote Control for Oil Burner." On auxiliary storage tanks used with manually operated burners such remote control may be installed on feed line between tank and burner.

(e) Except as provided by Rule 4(b) of these rules for approved combination burner and storage container devices,

pressure in storage tank or container for the purpose of discharging oil is prohibited.

(f) In systems where either steam or air is used for atomizing the oil, the oil and the atomizing supply shall be interlocked so that in case of the interruption of the atomizing supply, the supply of oil will immediately be cut off. Except that this requirement shall not apply to air and oil supply units directly connected to a common driver.

Rule 9—Oil Level Indicating Device and Test Wells

(a) All tanks located inside of buildings shall be provided with an oil level indicating device. Test wells shall not be permitted in tanks located inside of buildings. Unused tank openings shall be permanently sealed to prevent removal of plugs or cover.

(b) Oil level indicating devices shall be constructed of substantial materials so designed that there can be no leakage of oil or oil vapor.

(c) Test wells shall be capped oil tight and kept closed when not in use.

Rule 10—Permits, Plans, Inspections, and Tests of Storage Tanks and Piping

Section 1. Permits

(a) No oil installation of more than ten (10) gallons' capacity shall be operated until after a permit has been issued by the Fire Commissioner.

(b) Applications for approval for permit shall be made by the installer on forms furnished by the administrative official and shall provide for the location of the building in which the installation is to be made, name and address of owner and/or occupant, name and address of installer, make and approval number of burners, pumps and other devices, capacity, number and location of storage tanks, together with approval of such installation by the Commissioner of Buildings when required under Section 2 of this Rule 10.

(c) No permit shall be issued until the installation has been inspected by a representative of the administrative official.

Section 2. Plans

Except for installations in dwellings as defined in these rules the installer shall file with the Commissioner of Buildings plans showing the size and location of all storage tanks having a capacity greater than 275 gallons. Where such tanks are to be installed either inside of buildings or below the lowest floor level or outside of buildings below ground. Plans, however, shall be filed where 275 gallon tanks are to be buried. Such tanks shall not be installed until the location of the tank has been approved by the Commissioner of Buildings.

Section 3. Inspection and Tests of Installation of Storage Tanks and Piping

(a) Storage tanks of two hundred and seventy-five (275) gallons' capacity and all piping for oil connected thereto shall show no leakage when tank and all piping for oil is completely filled with oil when subjected to a test of 10 pounds.

(b) Storage tanks of more than two hundred and seventy-five (275) gallons' capacity and all piping for oil connected thereto shall show no change in shape, rupture or leakage when subjected to a hydrostatic test with water as follows:

(1) Oval, obround, rectangular and specially shaped storage tanks and piping connected thereto, twenty (20) pounds per square inch.

(2) Cylindrical storage tanks and piping connected thereto, fifty (50) pounds per square inch.

Pressure shall be applied for a period of ten minutes, released for five minutes, and again applied for a period of ten minutes. When oil is used there shall be no fire or flame in the room or rooms in which the test is being conducted. All tests shall be conducted in the presence of a representative of the administrative official. The contractor shall furnish all necessary equipment for conducting tests, except gauges which shall be furnished by the administrative official. Such test may be made with oil in freezing weather for tanks located outside of building.

(c) Defective tanks, if repaired by welding, shall have all oil removed and shall be purged of all explosive gases or vapors.

(d) The anti-siphon devices, where used as provided for in these rules, shall be tested to prove their operation following the test of tank and piping.

Section 4. Fee for Permit and Test of Storage Tanks and Piping

When application for permit is made, as provided for in Section 1 of this rule, a fee covering the permit, inspection and test of storage tank and piping shall be paid in accordance with the schedule given in the Code of Ordinances.

Rule 11—Inspection of Installations with Not More Than Six (6) Gallons' Storage Capacity

All installations of burners with not more than six (6) gallons' storage capacity, except where such installations are made in dwellings shall be reported by installer to the administrative official giving location of building in which installation is made, name and address of owner and/or occupant, name and address of installer and the make and approval number of burner. Such reported installations shall be inspected.

Rule 12—Ventilation

(a) No burner shall be installed in any boiler, heater, range or stove unless such boiler, heater, range or stove be connected with a legal chimney, complying with Section 392, Article 19, Chapter V, of the Code of Ordinances.

(b) Adequate ventilation, at least equivalent to area of the smoke pipe at the point where it enters the flue, shall be

provided in all rooms in which burners are installed.

(c) Dampers shall be so constructed that they cannot completely cut off the passage of flue gases at any time.

Rule 13—Automatic Pumps

Automatic pumps, when not an integral part of the burner shall be of approved type, provided with automatic means for preventing continuous discharge of oil in case of pipe breakage.

Rule 14—Fire Protection

(a) The clear distance between smoke pipe connections, of any boilers, furnaces or other heating apparatus to flues, and combustible material shall not be less than eighteen (18) inches, except that this clearance may be reduced to nine (9) inches where a baffle consisting of not less than No. 29 gauge sheet metal backed by 1/4 inch wick asbestos is placed two (2) inches above and extending along the entire length of the smoke pipe connections and such baffle is securely fastened from the ceiling with substantial hangers. In lieu of such baffle the combustible material may be covered with fire-retarding material as defined in these rules.

(b) The clear distance between any non-insulated heat-producing parts of boilers, furnaces or other heating apparatus and combustible material shall not be less than twenty-four (24") inches. Where such parts are insulated by two (2") inches of asbestos, or equivalent, the clear distance shall be not less than twelve (12") inches, or, in lieu of such insulation the combustible material shall be covered with fire-retarding material as defined in these rules extending 8 ft. in front and 4 ft. side and rear of the apparatus.

(c) No rubbish or other combustible material shall be stored or maintained within five feet (5') of heating apparatus.

(d) Burners and all accessories including tanks and piping, shall be maintained oil tight and kept clean at all times.

(e) The floor beneath boiler or furnace and within five (5) feet in all directions shall be of fireproof construction.

(f) Oil burning devices designed for installation with storage of not more than six (6) gallons shall be firmly anchored to the floor, set level, and the floor beneath such devices protected by a 1/2" asbestos or equivalent shield extending at

least twelve (12") inches beyond the outline dimensions of such device.

(g) Near each boiler or furnace of a fuel oil burning unit there shall be kept ready for use fire extinguishing equipment of not less than two quart capacity approved as suitable for oil fires or not less than two pails of sand.

Rule 15—Instruction Cards

(a) Cards, giving complete instructions for the care and operation of the system shall be permanently fixed near the apparatus in readable condition. Where burners or oil-burning heaters designed for use with storage of not more than six (6) gallons' capacity [Rule 4(b)] are installed, there shall also be posted a copy of the approval specifications in addition to the instruction card herein provided for.

(b) For manually operated systems not fully automatic the operator shall obtain a certificate of fitness from the fire commissioner.

Rule 16—Modification

When, for any reason, it may be impractical to comply strictly with the foregoing rules, or when additional protection is necessary, the administrative official shall have power to accept substitute methods so that the spirit and substance of these rules shall be complied with.

Rule 17—Existing Installations

Oil burner systems heretofore installed and duly approved as complying with all laws and rules applicable thereto shall be deemed acceptable.

Century N. Y. Distributor Places 2-Carload Order

CEDAR RAPIDS, Iowa—An order for two carloads of Century oil burners and boiler-burner units was recently received by the Century Engineering Corp. of this city from Century Products Co., New York distributor for Century oil burners.

Motor Wheel Has New Gun Burner

LANSING, Mich.—Heater division of Motor Wheel Corp. here has just introduced a new conversion type "gun" oil burner.

The new burner is adaptable to any type of heating plant and has a capacity of from 1.35 to 4 gal. per hour with maximum ratings of 1,500-sq. ft. steam, and 2,400-sq. ft. hot water radiation.

The new model burns No. 3 oil. Aluminum castings are used throughout in the construction. All hot or moving parts are enclosed in the exterior housing. A built-in silencer assures quiet operation and the model is equipped with a radio interference eliminator.

It employs a 1/6-h.p. direct-drive Emerson motor, Webster transformer, Tuthill pump, Detroit Lubricator pressure relief valve and strainer, draft-a-juster draft regulator, with Minneapolis-Honeywell or Mercoid controls optional.

Parker Joins Staff Of Torridheat

CLEVELAND—O. C. Parker, formerly wholesale representative for the Timken Silent Automatic Corp., has joined the field organization of the Cleveland Steel Products Corp., Torridheat oil burner division.

Mr. Parker, who becomes a district sales manager, will contact present dealers and distributors and will establish new outlets for Torridheat in Minnesota, Wisconsin, Illinois, Iowa, and Nebraska.

William R. Porter, a former branch manager for Timken, has been appointed manager of the oil burner division of Waite and Faunce, New Bedford, Mass., Torridheat dealer.

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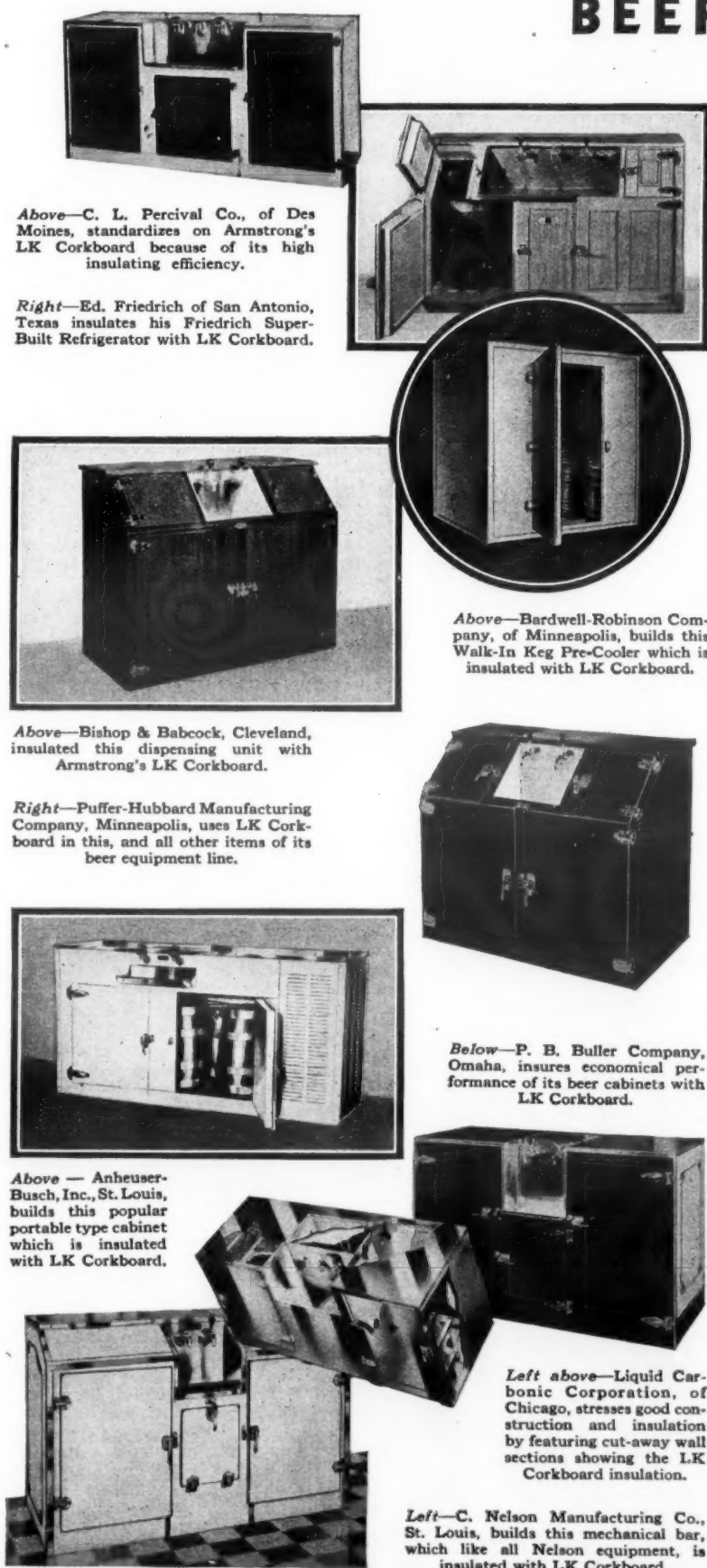
TODAY, buyers of beer equipment—like the buyers of the various other kinds of commercial equipment—are demanding more than simply good appearance and reasonable initial cost. They want the cold facts about performance . . . the assurance of continued operating economy and long life for the equipment they purchase.

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Above—C. L. Percival Co., of Des Moines, standardizes on Armstrong's LK Corkboard because of its high insulating efficiency.

Right—Ed. Friedrich of San Antonio, Texas insulates his Friedrich Super-Built Refrigerator with LK Corkboard.

Above—Bishop & Babcock, Cleveland, insulates this dispensing unit with Armstrong's LK Corkboard.

Right—Puffer-Hubbard Manufacturing Company, Minneapolis, uses LK Corkboard in this, and all other items of its beer equipment line.

Above—Anheuser-Busch, Inc., St. Louis, builds this popular portable type cabinet which is insulated with LK Corkboard.

Left above—Liquid Carbonic Corporation, of Chicago, stresses good construction and insulation by featuring cut-away wall sections showing the LK Corkboard insulation.

Left—C. Nelson Manufacturing Co., St. Louis, builds this mechanical bar, which like all Nelson equipment, is insulated with LK Corkboard.

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SERVICE

Service Instructions for Rice Methyl Chloride Machines

A PIONEER in the use of methyl chloride as a refrigerant, the Rice electric refrigerator was built in Detroit for several years prior to the demise of its manufacturer, Rice Products, Inc., in the summer of 1929. First Rice machines built were in commercial sizes, and many of these larger units are still in French, British, and American naval service.

Original development work on the Rice refrigeration system was directed by Isaac L. Rice, Sr., now dead, who may be remembered as the one-time president of Kelly-Springfield Tire Co., Electric Boat Co., Electric Storage Battery Co., and the Casein Company of America. The development of the Rice household refrigerator was also carried under his guidance.

Condensing Units

Rice condensing units consist of compressor assembly, motor assembly, fly wheel, fan pulley assembly, belt, condenser assembly, receiver assembly, together with the necessary shut-off valves and strainer, all mounted on an angle iron base.

Compressors are of the single-acting, vertical, reciprocating type, air cooled and lubricated by splash from the crankcase. They are belt driven by means of a moulded rubber and canvas "V" belt passing over the compressor flywheel which is 14 1/4 in. in diameter.

Crankshafts are of forged steel, heat treated and ground and are 1 1/4 in. in diameter on all types. Main bearings are of cast iron 1 3/4 x 1 1/4 in., and a bearing to take the thrust of the seal spring, is provided. Connecting rod bearings are babbitted to size and measure 1-3/16 x 1 1/4 in.

Pistons are of cast iron with suction valve mounted flush with the head. They are fitted with six piston rings; two in each of the three ring slots. Both suction and discharge valves are of the disc type.

Valves are lapped to their seats. The discharge valve plate is a die casting of a sound absorbing metal to avoid resonance.

A metallic stuffing box of special design has been provided. The seal ring is lapped to a seat formed by a shoulder on the crankshaft and is kept in contact by means of a 60 lb. spring.

The bore and stroke on both single and double cylinder compressors is 1-3/16 x 1-13/16 in.

Cold gases are drawn into the compressor through the jacket surrounding the cylinder, thus keeping the cylinder and piston at an efficient operating temperature.

Attention is drawn to the over-sized, counterbalanced crankshaft and the ball thrust bearing which takes the thrust of the crankcase seal No. 544.

Tight sealing of the piston rings is secured by means of the two high quality narrow rings which are installed side by side in each piston ring groove.

The parts comprising this compressor unit, as shown in Fig. 1, are as follows:

- 2100 Single cylinder compressor body
- 2102 Compressor head
- 2103 Bottom plate
- 2117 Head gasket
- 2121 Valve plate gasket
- 2123 Bottom plate gasket
- 2143-3 Crankshaft
- 505-2 Sleeve
- 523 Bottom plate housing washer
- 524 Housing cover

- 529 Housing gasket
- 542 Stuffing box housing
- 544 Seal ring
- 545 Seal retainer
- 546 Thrust bearing unit
- 549 Head bolts (4)
- 550 Housing-housing cover and bottom plate bolts
- 562 Seal spring
- 578 Head bolt gasket
- 580 Sylphon flange
- 581 Sylphon
- 761 Housing cover gasket
- 507-2-A Connecting rod assembly
- 2108-A Discharge plate valve assembly

The construction of the suction valve in the head of the piston and the discharge valve in the discharge valve plate permits of the same valve disc No. 795, which operates upon the valve seat of similar construction in both instances. The suction valve is free to move up and down but is limited to .010 lift by the valve cover plate 610-A.

The discharge valve No. 795 is held to its seat by means of a very light spring No. 797.

The lift of the valve is governed by the adjusting stop screw No. 782. The lift should be governed to ten-thousandths of an inch freedom and locked in position by means of the lock nut No. 798.

The proper way to set the discharge valve lift is to screw the adjusting stop screw No. 782 all the way down, holding the valve against the seat, then backing off the screw from 3/4 to 1/2 turn, then locking the lock nut.

If more than the ten-thousandths lift is permitted the valve will give a clicking noise which may be objectionable to some owners, although no

Piston Assembly

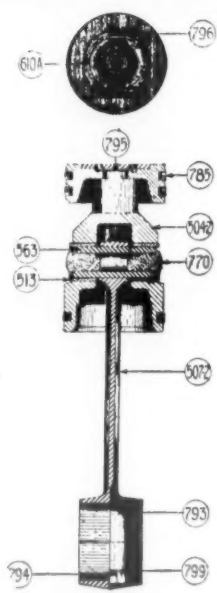


Fig. 2. Piston and connecting rod assembly of the Rice machine.

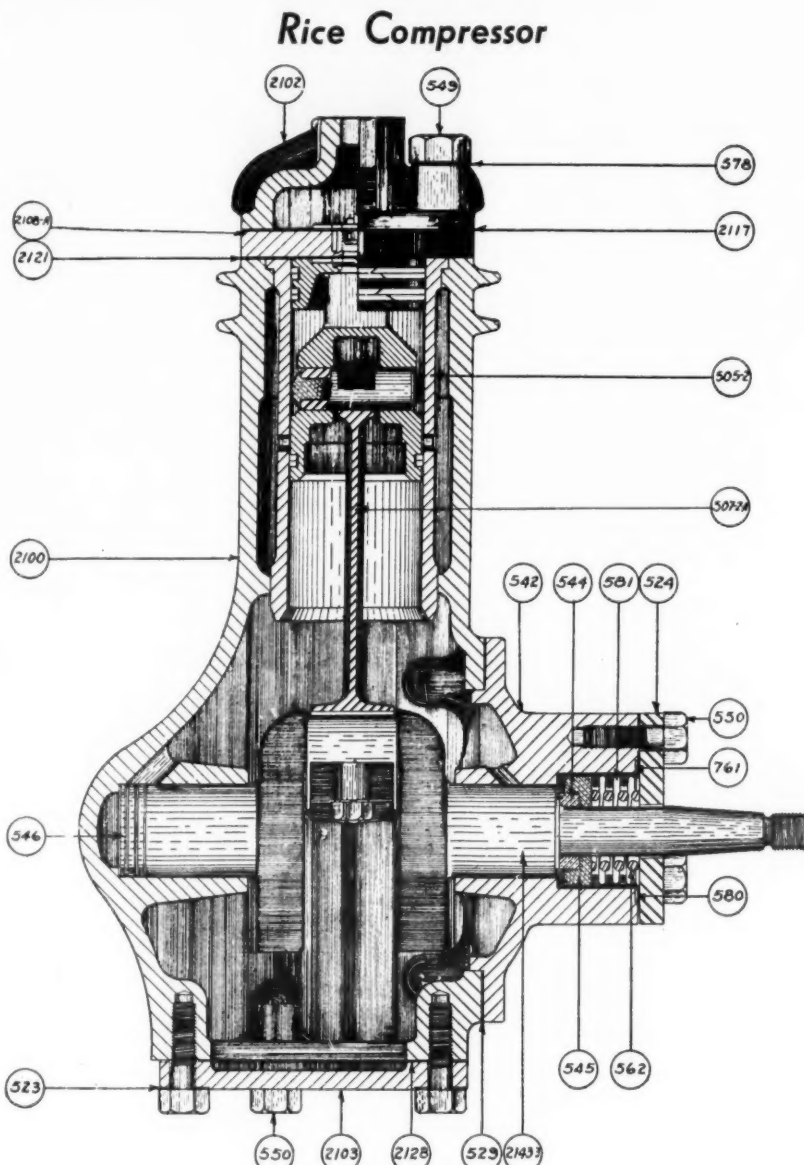


Fig. 1. Section of the Rice compressor. Key to the numbered parts will be found in columns one and two.

real damage to the valve will result.

The piston and connecting rod assembly is shown by Fig. 2. It consists of the following parts:

- 513 Wrist-pin bearings
- 507-2 Connecting rod
- 504-2 Piston
- 563 Wrist pin
- 610-A Valve retainer
- 770 Wrist pin button
- 785 Piston ring
- 793 Connecting rod bolt
- 794 Connecting rod nut
- 795 Suction valve
- 796 Retaining screw
- 799 Lock washer

Note the piston ring construction which shows the narrow rings in each groove. The top edge of the top ring in the lower or oil groove in the piston should be installed so that the top edge would be dulled. The lower edge of the lower ring should be left real sharp.

The discharge valve assembly is interchangeable on all compressor units. It consists of the following parts:

- 782 Valve spring guide
- 791 Retainer
- 795 Suction valve
- 796 Retainer screw
- 797 Spring
- 798 Valve spring guide nut
- 2108 Valve plate

Attention is drawn to the heavy plate construction and the recessing from the top side which leaves a very thin seat, and a very small clearance volume over the top of the piston.

Stuffing Box Seal

In order to seal the crankcase and prevent loss of methyl chloride from the system, a stuffing box unit is installed on flywheel end of crankshaft. The crankshaft has a shoulder which is glass hard and is ground and polished to a mirror finish.

A copper alloy thrust collar is held against this rotating shoulder by means of a coil spring. A metallic bellows or sylphon is attached to the thrust collar by means of the retainer No. 545 (Fig. 1), and the other end of sylphon is sealed by means of a lead gasket under the flange and clamped in place by means of plate No. 524. The spring compartment should be packed with graphite grease.

After a period of service it may be necessary to renew the stuffing box seal, such change being necessary by noting its tendency to leak and squeal due to the fact of the thrust collar being worn away permitting the shoulder on crankshaft to run against the brass retainer.

Before a new seal unit is installed, it is usually necessary to lap the seal ring to a perfect fit against the shoulder of crankshaft. This may be done by removing the cover plate No. 524, removing the old seal; then removing housing No. 542 in order to lap shoulder and seal ring together.

The thrust seal ring and the shoulder of the crankshaft should be covered with a small amount of Bon Ami and oil mixture, and the two parts rubbed together by hand until a bright smooth finish is obtained on both surfaces, the smooth finish denoting a perfect seat. Then the sur-

faces should be thoroughly cleaned with a rag and the new parts assembled into place.

In some instances when the seal leaks or squeals, upon examination it will be found that a piece of grit or other foreign matter has prevented the surfaces from properly functioning. The surfaces may be found to be slightly scratched and if so, they should be lapped to a smooth surface as before mentioned, and the old parts re-installed after thorough cleaning. Be sure to pack with grease before re-assembling.

To Reset the Suction and Discharge Compressor Valves

Should it be found that the discharge or suction valve is leaking due to imperfect seat or imperfect flat disc valve, the following methods should be followed in order to cure the trouble:

First, examine the flat disc valve to see if it has a complete circle of smooth contact where it has been operating on the valve seat. If it has not a complete circle of bearing it should either be lapped to a new flat surface, or should be replaced by a new valve disc.

If the valve seat itself does not show a perfect complete circle of bearing surface, it should be lapped to a perfect seat by means of the special lapping tool in conjunction with Bon Ami and oil being applied to the surface and rubbed to a smooth seat by means of the lap.

It is essential that careful attention be given to the quality of the finish on the valve seat and this can only be attained by careful use of the lapping tool. Be sure to wipe the valve and valve seat carefully by means of a rag before assembling.

Automatic Control by Temperature

The thermostat used to regulate Rice units is known as the Mercoid temperature control. The cover has a snap on catch and may be removed by prying carefully under the lip at either side. The thermostat is mounted directly on the evaporator.

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The electric circuit to the motor is opened and closed by the tilting of the Mercoid switch (A in Fig. 3) which causes the mercury to flow from one end to the other, making or breaking contact with the terminals.

The power element (B) consists of a metal bellows containing a gas which quickly expands with a slight rise in temperature. When temperature increases the power element exerts an upward push on the stem

Temperature Control

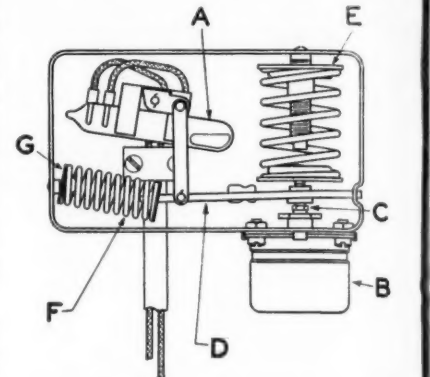


Fig. 3. Mercoid thermostat used on Rice refrigerators.

(C) forcing up the lever (D) which rocks the Mercoid switch to the left closing the circuit.

A decrease in temperature causes the power element to contract and the large adjusting spring at (E) throws the switch back, opening the circuit. Spring (F) gives the required "snap action" to the switch and is necessary to the proper option of the control.

Adjustment of Control

The control is set when shipped to make circuit at 40° F. and break circuit at 35° F. This is the temperature of the top of the cooling unit in contact with the power element (B) and is correct for most installations.

The range or operating temperature can be raised or lowered if necessary by turning the spring cap (E) up or down. Turn up to carry a lower temperature; down to carry a higher temperature. The difference between the make and break temperature will remain approximately the same, 5° (difference between 40° and 35°).

If in certain installations it is desired to keep the unit on and off for a longer period of time, this can be accomplished by inserting extra cone washers or "shims" (G). This places more compression on the spring (F) thus requiring a longer period of warming and cooling to cause the make and break.

This merely widens the "differential range." Two extra "shims," one at each end of the spring, will widen the control approximately 2° or from 5° to 7° F.

Automatic Control by Pressure

The pressure control switch used to regulate certain Rice units is known as the Mercoid pressure control. The cover has a snap-on catch and may be removed by prying carefully under the lip at either side.

The electric circuit to the motor is opened and closed by the tilting of the Mercoid switch (A Fig. 4) which causes the mercury to flow from one end to the other, making or breaking contact with the terminals.

The power element (B) consists of a metal bellows to which is attached a stem (C). The bellows within (B) is connected direct to the refrigerant on the low pressure side.

As the low side pressure increases (unit closed down) the bellows power element expands pushing downward

(Concluded on Page 13, Column 1)

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Service Instructions For Rice Machines

(Concluded from Page 12, Column 5)
on stem (C) and lever (D) which rocks the Mercoid switch to the right and closes the circuit.
Running of the unit causes a decrease in low side pressure allowing the bellows element to contract. The large adjusting spring at (E) then throws the switch back, breaking the circuit.

Adjustment of Control

The control is set to make circuit at 25 lbs. and break circuit at 5 lbs. low side pressure. This is correct for most installations.
The pressure range (and consequently the temperature) may be raised or lowered by turning the spring cap (E) up or down. Turn up to give higher pressure and higher

Pressure Control

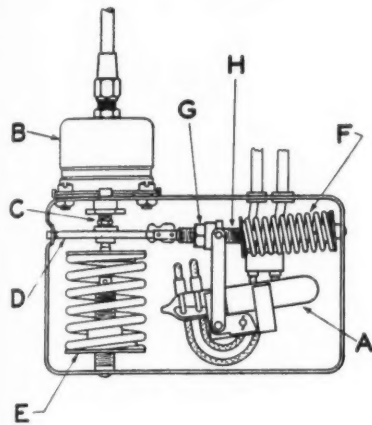


Fig. 4. Mercoid-built pressure control used by Rice.

temperature. Turn down to give lower pressure and lower temperature. This may slightly widen or shorten the differential, that is, the pounds difference between the make and break pressures. The differential may be adjusted also as explained below.

If in certain installations it is desired to keep the unit on and off for either a longer or shorter period, this can be accomplished by changing the differential adjustment on spring (F). Loosen nut (G) and by means of a wire pin or nail turn the stem (H) in or out.

Turn in to give a wider differential—causing longer periods of running and shut down. Turn out to give a shorter differential—causing shorter periods of running and shut down. Be sure to make nut (G) up tight after adjustment.

Adjustment of Rice Mercury Tube

The Rice temperature control is mounted in a sheet iron case with switch and two cartridge fuses.

At the bottom of the case is a junction box containing four leads from temperature control and switch. The two red leads are to be connected to the motor; the two black leads are to be connected to the power line.

To replace fuses, adjust this control, or repair the installation, push switch over the "off" position.

The adjustment of temperature range is made by the knurled screws marked on plate. To get a lower temperature, turn each nut equally in a counter-clockwise direction so as to take pressure off the springs.

To get a higher temperature, turn each nut equally in a clockwise direction, putting more pressure on the springs. One full turn on each nut will raise or lower the temperature at which the control operates, about 2° F.

To change the differential (that is the difference between the temperature that the control cuts in and the temperature that it cuts out) to increase, turn screw head marked (B) which is on the top of the oscillating toggle lever, clockwise, putting more tension on the toggle spring.

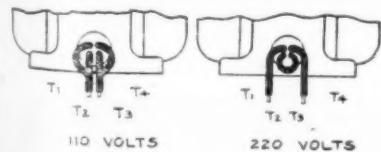
To shorten the differential, turn the screw head in a counter-clockwise direction, releasing the tension of the toggle springs. Two full turns of the differential screw will lengthen or shorten the differential or cut in and cut out point 1° F.

The control is furnished with bulb tube 7 ft. long.

Single Phase Motors

This motor is designed to operate on a circuit of the voltage and frequency stamped on the nameplate, although it will operate satisfactorily on a 10 per cent voltage variation. Low voltage will reduce both starting and maximum torque in proportion to the square of the reduction in the voltage, and therefore, should be guarded against.

The motor can be connected for operation on either 110 or 220 volt circuits as shown in the illustration.



The oil cups should be filled occasionally with a good grade of machine oil. Bearings may be caused to run hot by lack of oil or by poor oil. If the end of the bell of the motor is not properly replaced after being removed, it will cause misalignment of the bearings which will in time cause a hot bearing. A sprung shaft will cause a hot bearing.

A worn bearing can be detected by a chattering sound; an extremely worn bearing will cause interference between the armature and the stator.

The motor starts as a repulsion motor with current flowing through the brushes and commutator, at nearly full speed a centrifugal ball and spring short circuiter automatically short circuits the armature winding, thus causing the motor to run as a squirrel-cage induction motor.

When the short circuit device operates a sharp click can be heard. If the motor is greatly overloaded, the motor speed may be held down so low that the short circuit device does not have a chance to operate. This will be indicated by continued sparking at the brushes and by heating of the motor.

An overload may also cause frequent operating of the short circuiter. If the motor acts as though it is overloaded, turn the flywheel on the compressor and determine whether or not the load is greater than usual. If the load is normal, have the motor examined.

The Commutator

Any unusual conditions may cause sparking of the brushes which will cause the commutator to become dirty or to wear unevenly. A fine grade of sandpaper should be used to clean the commutator.

When the brushes become worn down too far to give good contact with the commutator, they should be replaced. The brushes should be held firmly in place but should be free enough for lateral movement.

In renewing brushes, brush noise can be eliminated by fitting the brushes to the commutator.

Valves and Valve Construction

All Rice machines are equipped with three shut-off valves in the methyl chloride circuit. They are known as the discharge shut-off valve, suction shut-off valve, and the king valve.

The discharge shut-off valve is mounted on the top of the compressor. The suction shut-off valve is mounted on the side of the compressor. The king valve is mounted on base between the condenser and the liquid line.

When the valves on the suction and discharge side of the compressor are turned as far as possible in a clockwise direction, the passage way to the gauge is opened and closed to the suction or discharge line. When the valve is partly opened by turning counter clockwise, then both passages are open.

When it is turned as far as it will go in a counter clockwise direction, the entrance to the gauge opening is closed and the entrance to suction and discharge line opened. Therefore, all gauges are put on and removed when the valves are wide open, to prohibit the escape of gas through the plug openings.

In the case of the king valve, this valve operates as any ordinary shut-off valve, with the exception that by screwing in a counter clockwise direction to its limit, it closes against the stuffing box, thereby preventing leaks.

Cooling Grid or Evaporator

The evaporator used in Rice refrigeration is an extremely simple unit made up of cast semi-steel sections similar in appearance to radiator sections but of lighter construction.

There are two types of sections, end and center, which permits units to be assembled in various combinations either side by side, in tiers, or both.

In each unit are ice trays of tinned copper measuring 10% in. x 3% in. x 1 9/16 in. Each tray is provided with a removable grid for forming twelve cubes 1 1/2 in. x 1% in. x 1% in. This is the standard size tray used in all Rice cooling units.

Each complete unit has a cabinet for the trays and a door to enclose them, thus insuring quick freezing of the water in the trays. The refrigerant, methyl chloride, enters the unit from the liquid line through the capillary tube at the bottom and boils off within the unit, which partially fills with this evaporating liquid.

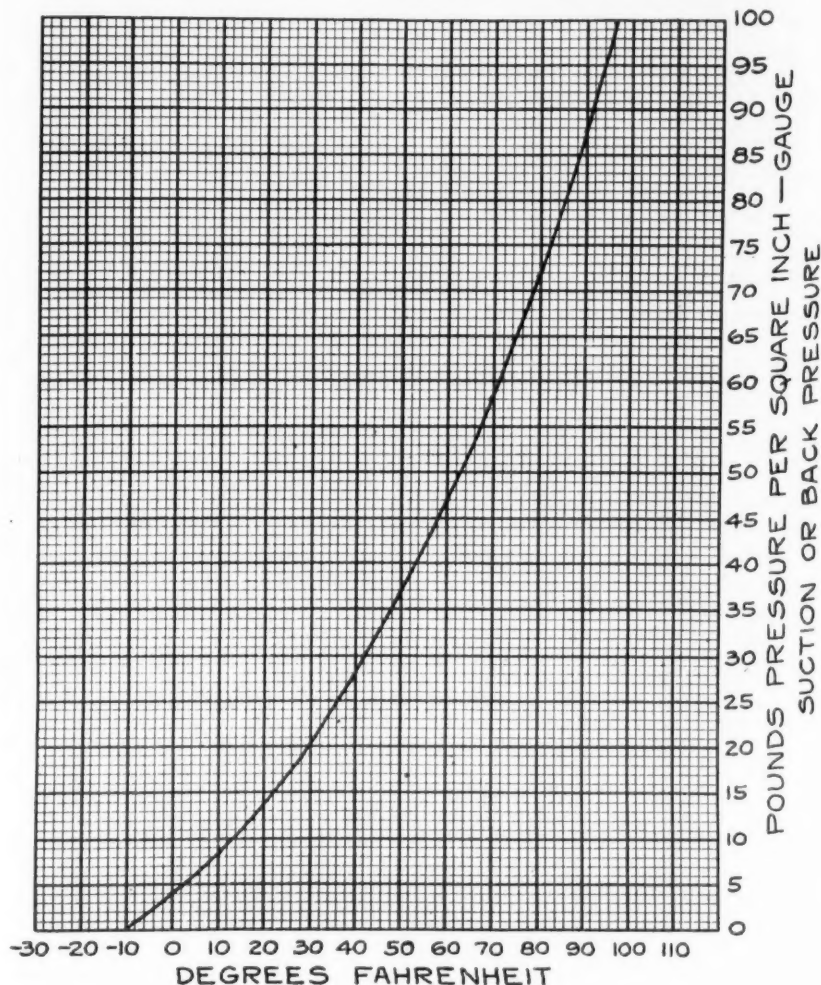
The suction line from the compressor is connected to the top of the unit farthest away from the capillary tube and here the vaporized methyl chloride, in the form of a gas which has absorbed its latent heat of vaporization from the interior of the refrigerator, is drawn back to the compressor.

Capillary Tube

The capillary tube used in the Rice system takes the place of the usual expansion valve used in other systems and is made of very fine copper or brass tube coiled up to a predetermined size to fit the various cooling units.

As the Rice system is automatic in its cycle of operation, this tube takes the place of the ordinary expansion valve and performs all of its functions. This tube is located between

Methyl Chloride Temperature-Pressure Chart



the 1/4-in. liquid line and the cooling unit.

Starting Machine

Go over and tighten all flanges and nuts on machine which may have become loose. The charge of refrigerant is confined in the condenser between the compressor discharge shut-off valve and the condenser king valve at the bottom of the condenser.

Before the gas is released into the system, all air must be evacuated from compressor, tubing and cooling unit. Extreme care should be exercised to prevent the entrance of air. When air is introduced undue harm results. Remove plugs from the suction and discharge shut-off valves. Attach compound gauge to suction shut-off valve. Open this valve completely by turning in a counter-clockwise direction. Turn stem back slightly to allow opening to gauge. Start the machine and when approximately 28 in. of vacuum has been reached attach pressure gauge to discharge shut-off valve.

Air entering the system at any point will be forced into the gauge causing gauge to show pressure. Check for leaks in this manner for at least ten minutes while compressor is running. Shut down machine for 20 minutes—vacuum gauge will fall if any leak is in the low side.

If there are no leaks apparent, open discharge shut-off valve by turning stem in a counter-clockwise direction. Turn back just enough to obtain reading on pressure gauge, then gradually open king valve by turning stem in a counter-clockwise direction as far as possible.

After the machine has run for some time, the pressure registered should be approximately as follows:

Head pressure gauge from 10 to 15 lbs. above room temperature, or, namely 80 to 90 lbs. gauge pressure based on 70° F. room temperature.

Suction or back pressure from three to five lbs. positive pressure when correct box temperature is obtained. If head pressure is not high enough, more refrigerant should be added. Determine this by frost level on cooling unit. A correctly charged and operating machine should show a frost level on the cooling unit to within 1/2 in. of the top, Rice engineers state.

If the machine is operating satisfactorily, open the suction and discharge shut-off valves (A) and (B) as far as possible, thereby closing the openings to the gauges. Gauges can then be removed and plugs replaced in the valve.

Questions and Answers

In this section an endeavor will be made to cover some of the questions that may arise in servicing the Rice machine. To render efficient service, first diagnose your trouble and then repair.

The proper temperature to carry in the cooling unit is 0° F. This is obtained by operating the machine at from three to five lbs. suction or back pressure. The correct head pressure should be from 10 to 12 lbs. higher than room temperature Fahrenheit.

What Would Cause High Pressure on Suction Side of Machine?

A high pressure on suction or low side of machine can be caused by two conditions. First, an overcharge of gas in machine. This can be determined by a heavy sweat on suction line, compressor and discharge line to

condenser cold. To remedy this, take out plug from discharge shut-off valve and open valve as above, allowing the gas to escape.

This is done while machine is in operation. Keep letting out gas until discharge line from compressor begins to get hot. Then close off discharge shut-off valve and watch results. If cooling unit starts to frost, and low or suction side gauge starts to pump down, screw plug back in discharge shut-off valve. Be sure frost level reaches top of cooling unit.

Second: Faulty Valves in Compressor. This can be determined by closing suction shut-off valve; turning clockwise, and you will notice that there is a fluctuation on gauge dial and compressor will not pump down towards a vacuum very rapidly. It is then necessary to take out compressor valves and look for the seat of the trouble.

To do this, leave suction shut-off valve closed. Close discharge shut-off valve. Take off bolts from head of compressor, remove head and examine both discharge and suction valves.

If no dirt is found under valve seats, it is evident that valves are not seating properly. They should be lapped in with a special lapping tool designed for this purpose, until a perfect seat is obtained.

What Would Cause a Low Pressure Or Vacuum on Low Side of Machine?

A low pressure or vacuum on suction side of machine can be caused by two things. First, after reading gauges look at cooling unit. If frost is leaving or has left entirely and the head pressure gauge shows a pressure from 60 to 80 lbs., it is certain that the capillary tube has a stoppage.

It is then necessary to take out capillary tube and either free same of this stoppage or replace tube with a new one.

Take gauge readings and then look at cooling unit. If head pressure is normal, say about 15 lbs. above room temperature, and the cooling unit is only frosted part way up, this would give you a low pressure on suction side and it will be necessary to shut down the machine because of leak. Let pressures equalize and go over all joints with soap and water until the leak has been found. Then add gas.

What Would Cause Machine to Operate at Short Intervals, Run 5 Minutes, Stop 5 or 10 Minutes?

Machine operating at short intervals is caused by the differential range on the thermostat not being set wide enough. This can be remedied by placing two or more washer caps or shims in horizontal spring in thermostat. Two of these caps will change

the operation. Add as required, but always place even number of caps at opposite ends of spring when making change.

How to Put Gauges in Shut-Off Valves

Take plug out of valves and screw in gauges and open valves about one-half turn in a clockwise direction.

To Add Refrigerant

Take out plug from suction shut-off valve and screw in 1/4-in. tee. Then put gauge in top of tee and connect charging tube to bottom. Connect other end of tube to methyl chloride drum, leaving drum standing up (do not tip drum to charge).

Then open valve on drum and close again immediately. Break connection at bottom of tee. This will discharge the air in charging tube. Tighten connection again and you are ready to charge.

Open suction valve about three turns by screwing stem clockwise, and notice pressure on gauge. If it is below 10 lbs., crack valve on drum and do not let pressure on gauge go above 12 lbs. This will always give you frost on cooling unit and show you how much gas is being put in.

Keep adding gas this way until frost level is up to the top of the cooling unit. Then shut off drum and screw all way down on suction shut-off valve. Take off charging line and replace plug in valve by using white lead on threads of plug.

To Pump Methyl Chloride from Cooler to Condenser; to Replace Capillary Tube or Make Any Repairs on Cooling Unit Side

Shut off king valve. Take out plug in suction shut-off valve and screw in gauge. Then crack valve stem back about one-half turn to show reading on gauge; start motor and allow it to run until all frost has left cooling unit entirely.

This can be speeded up by filling ice trays with hot water. When charge is entirely pumped into condenser, close off discharge shut-off valve and you can then make repairs necessary to capillary tube or cooling unit side of machine.

To Determine if Machine Is Fully Charged

This may always be determined by the frost level on cooling unit. In other words, after looking machine over and you have screwed on both gauges to suction and discharge shut-off valves and your pressures are about normal; namely, from 10 to 15 lbs. above room temperature on the head pressure gauge and 3 to 5 lbs. on your suction or low pressure gauge, but cooling unit does not frost to the top of the outlet on suction side after machine has been operating for at least 1/2 an hour, it is then necessary to add more refrigerant.

To Determine if Machine Is Overcharged

You will find that suction line is covered with sweat and compressor is cold; also discharge line to condenser is cold. This will give a high back pressure and cause a long or constant operation.

To Reduce Charge of Methyl Chloride

Take out plug from discharge shut-off valve and crack valve off seat to allow gas to escape. Leave machine running while doing this and continue until discharge line gets hot and frost level shows to top of cooling unit.

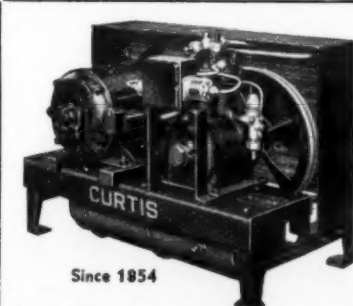
Indication of a Plugged Capillary Tube

Screw in gauge on suction shut-off valve and crack open about one-half turn. If gauge shows vacuum and cooling unit has defrosted, screw in gauge on discharge shut-off valve and crack open as above.

If gauge shows 60 to 80 lbs. head pressure, this will show that capillary tube has a stoppage and machine has pumped all methyl chloride back to condenser. Relieve stoppage by cleaning or replacing capillary tube with a new one.

How to Make Belt Adjustments

If belt is found either too tight or too loose, the motor is mounted on a sliding base with a thumb screw on left-hand side facing commutator end of motor. This can be adjusted to either take up or slack off on the belt, whichever may be needed. Do not have belt too tight as it will cause noisy operation. Always be sure to keep the motor pulley in line with the flywheel.



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Times Releases Survey Of New York Market

NEW YORK CITY—Recently completed is an exhaustive Consumer Census of the New York City market conducted by R. L. Polk & Co., Detroit, and released by the national advertising department of the New York Times.

More than 90,000 New York homes were canvassed by five hundred trained investigators who interviewed the women heads of families. According to tests made by R. L. Polk & Co., this number of interviews gave an accurate index to the situation for the city as a whole.

The Consumer Census is said to be the largest of its kind ever made by an independent organization. The Times acquired the right to use the figures after the survey was completed, and did not act as its sponsor during the taking of the census.

R. L. Polk & Co. classifies consumers according to buying power into three groups designated as A, B, and C. To establish the habits and spending ability of consumer families, averages were taken of the varied expenditures made. Families in the C group might purchase a few articles of moderate to high price, but most of their purchases are in the cheaper price range.

Shown below is a summary of the percentage of all New York families buying various types of merchandise during the past two years as compared with the percentage of Times families purchasing the same articles.

	Percentage of All New York Families That Bought in 2 Years	Percentage of Times Families That Bought in 2 Years
Mechanical		
Refrigerators	12.57	28.99
Vacuum Cleaners	28.86	31.33
Radio Sets	6.73	10.06
Electric Washers	.64	.84
Automobiles	7.50	11.94

The following summary gives census data on all New York families as compared with Times readers.

	All New York Families	Times Families
Average Rent Paid	\$ 50.75	\$ 94.64
Average Insurance	3,623.00	7,816.00
Mechanical		
Refrigerators	19.13%	43.82%
Radio Owned	74.31%	83.18%
Vacuum Cleaners Owned	36.70%	66.62%
Washing Machines		
Owned	2.46%	5.22%
Automobiles Owned	17.88%	25.79%
Pianos Owned	27.18%	37.63%
Savings Accounts Owned	34.46%	55.62%
Checking Accounts		
Owned	18.07%	45.55%
"A" Families	4.37%	17.51%
"B" Families	34.62%	53.76%
"C" Families	62.26%	28.76%

Estimate of Bureau Puts Five-Months' Total at 813,571

	Five Months Quota*	Estimated Total Sales	% Quota Realization
New England Division			
Connecticut	10,006	11,121	111.1
Maine	4,108	4,268	103.8
Massachusetts	25,597	31,285	122.2
New Hampshire	2,649	2,851	107.6
Rhode Island	4,199	4,971	118.3
Vermont	1,719	1,584	92.1
Eastern Division			
Delaware	1,068	1,907	178.5
Maryland & D. C.	10,566	23,955	226.7
New Jersey	25,585	34,175	133.5
New York	80,490	100,354	124.6
Pennsylvania	45,073	76,286	169.2
East Central Division			
Kentucky	5,872	12,294	209.3
Ohio	33,649	56,687	168.4
West Virginia	4,144	11,350	273.8
Middle West Division			
Iowa	9,886	14,062	142.2
Kansas	7,346	13,251	180.5
Missouri	14,468	32,052	221.5
Nebraska	5,087	10,638	209.1
Pacific Coast Division			
Arizona	1,516	2,405	158.6
California	40,921	41,246	100.7
Nevada	371	777	209.4
North West Division			
Idaho	1,718	3,114	181.2
Montana	1,846	3,398	184.0
Oregon	5,205	11,350	218.0
Utah	2,529	4,213	166.5
Washington	9,373	12,466	132.9
South Eastern Division			
Alabama	3,737	9,823	262.8
Florida	5,091	6,489	127.4
Georgia	4,321	12,460	288.3
North Carolina	5,691	14,815	260.3
South Carolina	2,266	6,208	274.0
Tennessee	5,087	14,426	283.5
Virginia	5,736	13,637	237.7
Great Lakes Division			
Illinois	40,118	60,737	151.3
Indiana	14,701	21,519	146.3
Michigan	23,081	33,062	143.2
Wisconsin	13,614	14,220	104.4
North Central Division			
Minnesota	10,293	11,152	108.3
North Dakota	1,306	2,143	164.0
South Dakota	1,673	2,782	166.2
Rocky Mountain Division			
Colorado	4,378	6,639	151.6
New Mexico	722	1,687	233.6
Wyoming	682	1,560	228.7
Southwestern Division			
Arkansas	2,368	5,314	224.4
Louisiana	4,286	5,496	128.2
Mississippi	1,855	2,791	150.4
Oklahoma	5,476	11,915	217.5
Texas	13,990	32,625	233.2
Totals	525,463	813,571	154.6

*Five months quota is 52 per cent of years quota of 1,010,506 refrigerators.

PATENTS

Issued June 19, 1934

1,963,275. PROCESS OF TREATING VERMICULITE. Otto A. Labus, Wisconsin Rapids, Wis. Application Oct. 25, 1933. Serial No. 695,208. 14 Claims. (Cl. 252-1.)

1. The process of treating a mineral of the vermiculite group consisting in preliminarily heating the mineral at a sufficiently low temperature gradient both to heat the mineral and to expel its uncombined moisture but below the temperature required to drive off its water of constitution and then directly thereafter heating such preheated mineral at a relatively high temperature gradient sufficient to expel its water of constitution, whereby to obtain a stable, highly-cellular product through the transmutation of the mineral by the expulsion of such water of constitution.

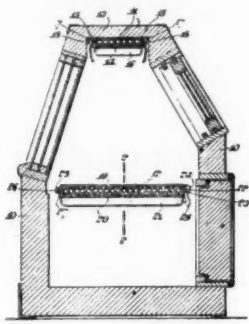
1,963,276. EXPANDED VERMICULITE MANUFACTURE. Carl S. Miner, Glencoe, and Richard Ericson, Chicago, Ill., assignors, by mesne assignments, to National Vermiculite Products Corp., Chicago, Ill., a corporation of Illinois. Application Aug. 8, 1932. Serial No. 627,906. 4 Claims. (Cl. 252-1.)

1. The method of producing plastic expanded vermiculite, consisting in heating the vermiculite sufficiently rapidly to effect its practically maximum expansion and substantially immediately cooling the expanded vermiculite quickly and adequately enough to prevent it from becoming materially friable.

1,963,412. HUMIDIFIER. Carroll E. Lewis, Minneapolis, Minn., assignor to Lewis Air Conditioners, Inc., Minneapolis, Minn., a corporation of Delaware. Application Nov. 28, 1930. Serial No. 498,769. 5 Claims. (Cl. 261-15.)

1. A humidifier comprising an upwardly extending flue having an air intake passage in the lower end thereof and an air discharge passage in the upper end thereof, a radiator having a core traversing and substantially filling the cross sectional area of said flue intermediate of said passages, said core having a multiplicity of vertically disposed passages therethrough producing a stack action of air upwardly and distributing moisture and effecting a downward flow thereof through said core, said radiator having headers disposed without said flue and being adapted for connection with a circulating fluid heating system and a nozzle adapted to be connected with a source of humidifying medium, said nozzle being mounted centrally of said flue above the core of said radiator and directed downwardly longitudinally of said flue to discharge moisture directly against said core.

1,963,565. REFRIGERATOR. Frederick



1,963,565

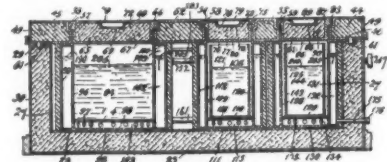
J. Stollsteimer, Brookline, Pa. Application Jan. 26, 1931. Serial No. 511,207. 5 Claims. (Cl. 62-59.6.)

2. The combination, with the cooling unit of a refrigerator chamber, of means for removing frost therefrom, without substantially increasing the temperature thereof, comprising a plurality of removable casings for the exposed surfaces of said cooling unit, said casings being adapted to replace each other to effect the defrosting.

1,963,570. WATER COOLER. Joseph A. Warren, Mount Vernon, N. Y. Application Dec. 23, 1927. Serial No. 242,041. 11 Claims. (Cl. 62-115.)

1. A refrigerating apparatus comprising a base adapted to support the following parts, a casing secured to said base and forming the outer casing for the apparatus, a supporting framework removably mounted within said outer casing and supported therein at its upper and lower ends and adapted to be removed therefrom as a unit, refrigerating mechanism wholly supported by said framework and removable therewith including a condenser, an electric motor removably secured to said framework and removable therefrom as a unit, a fan driven by said motor to cause air to pass over said condenser, an evaporator within said casing, and a liquid container within said evaporator spaced apart therefrom and supported by said casing.

1,963,625. REFRIGERATING APPARATUS. John R. Lassiter, Jr., New York, and Clara E. Quinn, Hastings upon Hudson, N. Y., and John G. Lapham, Jersey City, N. J., assignors to Drille Appliances



1,963,625

Inc., New York, N. Y., a corporation of Delaware. Application June 10, 1933. Serial No. 675,158. 5 Claims. (Cl. 62-101.)

1. In a refrigerating apparatus the com-

Exports of Electric Refrigerators

April, 1934, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

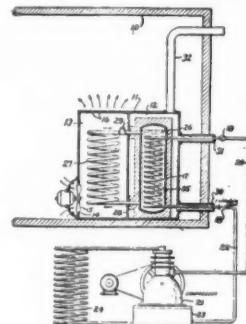
	Electric Household Refrigerators		Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators	
	Number	Value	Number	Value	Value	Value
Austria	25	\$ 1,739	2	\$ 170	702	\$ 702
Belgium	62	5,219	93	9,998	4,703	4,703
Bulgaria	...	...	...	...	...	...
Czechoslovakia	210	12,660	7	3,416	3,470	3,470
Denmark	...	...	4	570	735	735
Finland	...	...	3	200	85	85
France	1,177	108,550	1,066	100,335	61,372	61,372
Germany	379	30,937	74	6,232	29,937	29,937
Gibraltar	1	166	1	150	59	59
Greece	75	7,489	...	...	24	24
Irish Free State	86	6,839	128	16,943	3,178	3,178
Italy	207	18,207	81	7,666	10,368	10,368
Netherlands	71	6,468	55	6,539	12,995	12,995
Norway	88	7,821	29	2,712	946	946
Portugal	19	2,015	...	...	144	144
Rumania	10	1,703	...	...	...	...
Spain	243	19,349	34	5,541	5,937	5,937
Sweden	150	13,277	2	473	2,028	2,028
Switzerland	157	13,347	61	5,123	10,860	10,860
United Kingdom	1,821	128,099	132	12,232	45,831	45,831
Yugoslavia	43	893	10	1,113	10,085	10,085
Canada	421	34,709	194	25,291	103,085	103,085
Costa Rica	4	308	...	...	4	4
Guatemala	1	90	...	...	16	16
Honduras	3	141	1	34	13	13
Nicaragua	1	177	...	...	...	...
Panama	21	2,467	...	...	837	837
Salvador	5	540	...	...	...	...
Mexico	272	24,342	3	261	2,354	2,354
Newfoundland and Labrador	...	...	...	...	22	22
Bermudas	44	4,766	3	393	450	450
Barbados	12	481	...	...	29	29
Jamaica	1	70	...	...	...	...
Trinidad and Tobago	16	1,620	...	...	17	17
Other British West Indies	9	918	...	...	162	162
Cuba	44	4,410	14	2,119	413	413
Dominican Republic	2	154	...	...	481	481
Netherlands West Indies	13	1,427	1	103	139	139
French West Indies	1	65	...	...	...	...
Haiti, Republic of	23	2,455	...	...	27	27
Virgin Islands of U. S.	7	440	...	...	23	23
Argentina	173	16,827	1	80	1,974	1,974
Brazil	6	443	...	...	10,914	10,914
Chile	14	1,426	...	...	84	84
Colombia	12	1,066	...	...	205	205
Ecuador	13	1,333	...	...	...	...
British Guiana	54	6,709	...	...	...	...
Surinam	10	606	...	...	187	187
Peru	...	...	...	...	78	78
Uruguay	67	7,517	1	126	762	762
Venezuela	2	272	...	...	35	35
Arabia	289	24,746	6	523	1,919	1,919
British India	100	10,518	2	737	899	899
British Malaya	14	1,534	...	...	153	153
Ceylon	235	17,833	3	246	1,093	1,093
China	204	21,019	3	656	2,275	2,275
Netherlands East Indies	24	2,797	...	...	212	212
French Indo-China	19	1,973	2	773	1,114	1,114
Hong Kong	2	231	...	...	...	...
Iraq	5	430	1	290	1,652	1,652
Japan	273	24,651	56	8,171	2,078	2,078
Palestine	28	2,793	5	1,134	1,125	1,125
Philippine Islands	2	113	...	...	...	...
Siam	11	1,089	...	...	160	160
Syria	42	4,257	12	1,886	170	170
Turkey	1	73	...	...	...	...
Other Asia	139	7,883	...	...	2,312	2,312
Australia	1	105	...	...	...	...
French Oceania	1	93	...	...	453	453
New Zealand	5	830	...	...	40	40
Belgian Congo	9	740	...	...	3,653	3,653
British East Africa	348	27,155	2	188	99	99
Union of South Africa	4	276	...	...	4	4
Gold Coast	1	131	...	...	54	54
Nigeria	35	3,881	17	2,489	1,798	1,798
Other British West Africa	526	46,396	95	10,100	4,481	4,481
Egypt	7	762	...	...	60	60
Algeria and Tunisia	249	20,526	8	535	490	490
Madagascar	3	903	...	...	8	8
Morocco	3	278	...	...	...	...
Mozambique	3	278	...	...	...	...
Canary Islands	3	278	...	...	...	...
Total	5,639	\$735,273	2,213	\$235,681	\$343,063	\$343,063
Shipments to Hawaii	235	24,661	2	557	8,379	8,379
Puerto Rico	30	3,422	3	612	862	862

ination of a cold storage tank charged with a cooling agent, a jacket surrounding said tank, a cooling container for a material to be cooled in said apparatus, a jacket surrounding the container, piping connecting the lower portions of said jackets, piping connecting the upper portion of said jackets, the jackets and piping adapted for the circulation of a volatile circulating fluid and equalizer piping connecting the upper portions of said jackets.

1,963,674. REFRIGERATING DEVICE. George T. Pearsons, New York, N. Y., assignor of five-sevenths to George W. Shields, Flushing, N. Y. Application Jan. 22, 1929. Serial No. 334,187. 17 Claims. (Cl. 62-91.5.)

16. A casing having a chamber for solidified gas, a compartment with no communication with said chamber, a second chamber, having a wall exposed to said compartment, in communication with the first chamber, with no communication with the compartment and with no communication with the exterior of the casing except through said first chamber, and means to conduct the gas from the first and second chamber to the exterior of the said casing, and a valve controlling the outlet of said conducting means.

1, 963,698. AIR CONDITIONING SYSTEM. Samuel Garre, Jr., Pelham, N. Y.



1,963,698

Application Nov. 1, 1933. Serial No. 686,272. 6 Claims. (Cl. 62-1.)

6. A room to be cooled, a cooling unit in said room, a vented casing surrounding said cooling unit, one or more connections to said cooling unit, and housing means for said connections sealed to the room to be cooled and opening to said vented casing and to the air exteriorly of the room to be cooled.

1,963,743. REFRIGERATING CONTAINER. William H. Hoodless, Philadelphia, Pa. Application May 31, 1930. Serial No. 458,201. 9 Claims. (Cl. 62-91.5.)

1. A throw away refrigerator container, comprising a receptacle for the material to be refrigerated, and for solidified carbon dioxide, and a surrounding mass of diatomaceous earth, the cells of which are of such size and configuration as to be comparatively impenetrable by the sublimed carbon dioxide gas but comparatively penetrable by air, whereby the cells may be filled or surrounded by relatively stationary, insulating air.

1,963,786. COOLING SYSTEM. Everett E. Glenn, Philadelphia, Pa. Application Aug. 20, 1932. Serial No. 629,610. 5 Claims. (Cl. 527-8.)

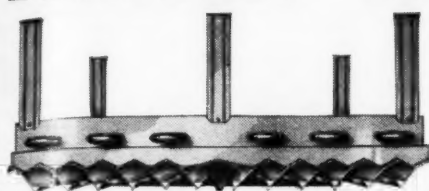
1. A radiator cooling unit of the character described comprising a cabinet having a lower compartment adapted to receive a radiator and an upper compartment adapted to house refrigerating means, and means for forcing a relative air circulation between the refrigerating means and the radiator, said refrigerating means including a chilled coil located above the radiator space and said circulating means including a fan adjacent one end of the cabinet and a deflector adjacent the other end.

1,963,818. METHOD OF MAKING AN ADSORPTION AGENT. Leonard Kay Wright, Jackson Heights, N. Y. No drawing. Application Sept. 7, 1927. Serial No. 218,114. 3 Claims. (Cl. 252-2.)

2. In a method of making an adsorbent by treating a siliceous material to secure a silica skeleton, cleansing the skeleton with a volatile organic solvent, and heating the skeleton under reduced pressure to evolve the volatile solvent and activate the siliceous skeleton.

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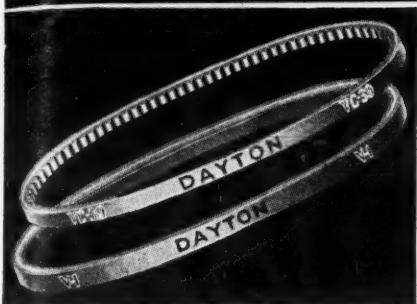
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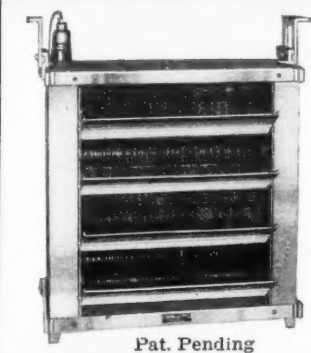
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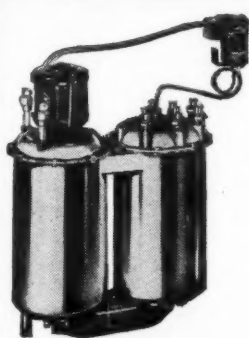
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AIR-E-FEX Air-Conditioning Units

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Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)

Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)

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QUESTIONS**Refrigerator Saturation**

No. 1709 (Salesman, Iowa)—"Would you please give me this information as nearly as possible—the per cent of electric refrigerators in use in the United States, according to wired homes. I am an electric refrigerator salesman and get a lot of good information from ELECTRIC REFRIGERATION NEWS."

Answer: The number of household electric refrigerators in use as of Jan. 1, 1934, was estimated at 4,665,000. Wired homes numbered 19,843,724 at that time. The wired homes saturation in the United States was estimated to be 23.5 per cent.

Service Manual

No. 1710 (Dealer, Minnesota)—"Please give us the name and address of the company publishing a book on refrigeration service. I saw the address in a copy of ELECTRIC REFRIGERATION NEWS but I can't find it now."

Answer: See below.

No. 1711 (Manufacturer's agent, New York)—"Our client, the G. W. Robinson Co., Ltd., of Hamilton, Canada, are interested in procuring the 'Electrical Refrigeration Service Manual' covering all makes of refrigerators."

"If you issue this manual, will you kindly forward complete particulars direct to the above-mentioned client, marked for the special attention of Mr. H. W. Wylie."

Answer: We have not published a service manual. Gernsback Publications, Inc., 96 Park Place, New York City, publishes an "Official Refrigeration Service Manual."

Refrigerators for Farms

No. 1712 (Distributor, Texas)—"We would appreciate your giving us by return mail the names and addresses of all manufacturers of either oil-burning or gas-burning refrigerators for rural use, or any other kind of refrigerators designed for rural use. In other words, refrigerators of the type of Superflex or Electrolux oil-burning refrigerators."

Answer: (See below).

No. 1713 (Tennessee)—"I want to buy a refrigerator that runs by kerosene or gasoline. I want one for a small beer and soft drink stand; also would want to make monthly payments on same and can furnish good references."

Answer: Electrolux, manufactured by Electrolux Refrigerator Sales, Inc., Evansville, Ind., is furnished in both gas and kerosene-operated types. Gibson Electric Refrigerator Corp., Greenville, Mich., makes the Kero-unit, and Perfection Stove Co., Cleveland, O. makes the Superflex, both of which are kerosene-operated refrigerators. The Icy Ball manufactured by Crosley Radio Corp., Cincinnati, O., is also an absorption refrigerator.

Waukesha Motor Co., Waukesha, Wis., makes a household refrigerator which is powered by a gasoline engine.

Units for Export

No. 1714 (Export Agent, New York)—"I am interested in getting in touch with a small but substantial manufacturer of electric refrigerating units for export."

"The inquiry as I received it calls for lowest cash prices on 'freezing units' only. From this description I take it that neither the cabinet nor the motor is required."

"Will you be good enough to supply me with a few names of such firms who in your opinion might be best qualified to entertain such business."

Answer: See page 274 of the 1934 REFRIGERATION DIRECTORY for manufacturers of household refrigeration systems not including cabinets. Manufacturers of household evaporators are listed on page 200.

Easy Way Freezer

No. 1715 (Dealer, New York)—"Would you be so kind as to tell me who manufactures an electric unit to put in home electric refrigerators to churn ice cream. I have seen a picture of one of these some time ago, but cannot seem to find who manufactures them."

Answer: (See below).

No. 1716 (Factory Representative, Singapore)—"I am enclosing herewith a letter to the Easy-Way Co., manufacturers of the Easy-Way freezer, and will greatly appreciate it if you will see that the letter is delivered to them."

"I am a subscriber to ELECTRIC REFRIGERATION NEWS and read about the Easy-Way freezer in the April 25 issue. No address is mentioned, and, therefore, I am asking your kind cooperation."

Answer: The Easy-Way Co., manufacturers of the Easy-Way ice cream freezer for household electric refrigerators, should be addressed at 432 Marquette Rd., Chicago, Ill.

ators, should be addressed at 432 Marquette Rd., Chicago, Ill.

Gibson Refrigerator

No. 1717 (Dealer, Illinois)—"Will you kindly advise us who makes the Gibson electric refrigerator, and where we can get in touch with them."

Answer: Gibson Electric Refrigerator Corp., Greenville, Mich.

Beer Cooler Manufacturers

No. 1718 (N.R.A., Washington, D. C.)—"Do you have a list of people who come within the definition of the Beverage Dispensing Equipment Industry as set forth in Article II, Section 1 of the Code of Fair Competition for the above industry, copy of which is enclosed?"

Answer: The 1934 REFRIGERATION DIRECTORY lists manufacturers of beer coolers, both draft and bottle type, beginning on page 151; beverage coolers, bottle and bulk types, starting on page 156; and soda fountains, which will be found on page 306.

Air Conditioning Data

No. 1719 (Advertising Agency, Pennsylvania)—"We would like to have any tear sheets of articles which are available on air conditioning for homes, estates, apartments, restaurants, stores, office buildings, and other installations of like size."

"We particularly want data on air cooling units and the market for them. Any surveys you have will, I think, be helpful."

Answer: Air conditioning developments are reported regularly in the weekly issues of ELECTRIC REFRIGERATION NEWS. Several issues have devoted special editorial attention to air conditioning, these being as follows: August 10, 1932; April 12, 1933; July 12, 1933; December 27, 1933; May 2, 1934, and June 27, 1934.

A survey of air conditioning installations in twelve major cities begins on page 465 of the 1934 REFRIGERATION DIRECTORY. The breakdown shows installations made prior to 1933 and those made during 1933.

Porcelain Plants

No. 1720 (Manufacturer, Indiana)—"Can you tell us where we may obtain a list of the refrigerator manufacturers who possess their own enameling plants. If you can supply such a list or tell us where it may be obtained, it will be much appreciated."

Answer: The following manufacturers of electric refrigerators operate their own porcelain enameling plants: Frigidaire Corp., Dayton, O.

General Electric Co. (Porcelain plant at Erie, Pa.)

Gibson Electric Refrigerator Corp. (Porcelain plant at Erie, Pa.)

Gibson Electric Refrigerator Corp. (Porcelain plant at Erie, Pa.)

Fond Du Lac, Wis.

Heinz & Munschauer, Buffalo, N. Y.

Jewett Refrigerator Co., Buffalo, N. Y.

Kelvinator Corp., Detroit, Mich.

(Porcelain plant in Grand Rapids, Mich.)

Norge Corp., Detroit, Mich.

(Porcelain plant in Muskegon, Mich.)

Sanitary Refrigerator Co. (Porcelain plant in Muskegon, Mich.)

Fond Du Lac, Wis.

Servel Sales, Inc., Evansville, Ind.

Westinghouse Electric & Mfg. Co. (Porcelain plant in Muskegon, Mich.)

Mansfield, O.

Spanish Publication

No. 1721 (Manufacturer, Illinois)—"Our Spanish distributor has informed us that one of their friends has told them about seeing a review dealing with electric refrigerators in a magazine issued in the Spanish language."

"We have no knowledge of such magazine or paper and are wondering if you are acquainted with it. Our distributor has requested us to secure a copy if possible, and we would like to help them out."

Answer: If any reader knows the name of the publication containing this review, we will be glad to pass it on to the inquirer.

Food Refrigeration

No. 1722 (Advertising Agency Illinois)—"The Department of Commerce at Washington has given us your name as possessing information concerning the proper refrigeration of food products."

"We wonder if you have anything of this nature in booklet or pamphlet form which might be used in developing commercial refrigeration sales."

Answer: Considerable information relative to correct temperatures for the proper preservation of food products can be found in back issues of REFRIGERATED FOOD NEWS, monthly publication covering the application of commercial refrigeration to the preservation of food products. Publication of this periodical was discontinued early this year.

Following are some references to articles in back issues dealing with this subject: February 1932—"Refrigeration Stops Growth of Most Disease Producing Organisms, Bacteriologist Says."; "Importance of Air Conditioning in Packing Industry Growing" Says Koenig, Executive of Armour & Co.; March, 1932—"Stopping Action of Bacteria Is Essence of Food Preservation."

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serving Methodology."; "Fate of Food Under Refrigeration Will Depend on Three Main Variables."; "Dr. Prescott Describes Bacterial Growth in Foods at Various Temperatures."; "Relation of Relative Humidity to Shrinkage in Pre-Cut Fresh Meats."; June, 1932—"Temperature Greatest Factor in Apple Storage."; October, 1932—"Bacterial Growth Checked by Use of Farm Milk Coolers."; March, 1933—"Fruits, Vegetables Keep Best at 34° F. Tests Reveal."; July, 1933—"Grapefruit Held in Storage at 36° F."

Copies of these issues may be secured for 10 cents each by addressing Business News Publishing Co., 5229 Cass Ave., Detroit.

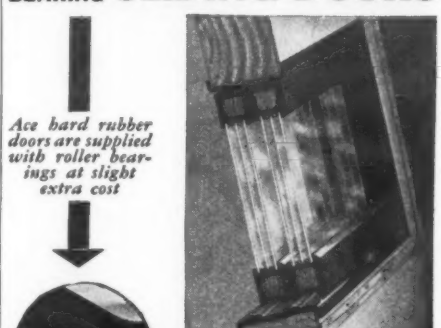
Refrigeration School

No. 1723 (Florida)—"I am anxious to communicate with some reliable school, or a manufacturer who may be conducting a school of practical training pertaining to domestic and commercial refrigeration. Will you kindly furnish me with the name and address of same?"

Answer: We suggest that you communicate with the Utilities Engineering Institute, 404 Wells St., Chicago, Ill.

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